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CONTENTS • NOVEMBER 1961

VOL. 51, NO. 11

AMERICAN
Journal of Public Health
AND THE NATION'S HEALTH

Articles PAGE

Man and His Changing Environment:

The Changing Physical and Biological Environment of Man 1631
Abel Wolman, Dr.Eng.

Historical Perspective 1637
Fred B. Rogers, M.D., M.P.H.

Public Health and Some Major Changes of Our Time 1641
N. J. Demerath, Ph.D.

Public Administration 1645
Robert G. Webster

Radioactive Wastes in the Marine Environment 1647
Robert M. Brown, P.E., and Donald W. Pritchard, Ph.D.

A State Approach to Air Pollution 1662
John A. Maga

Disinfection of Sea Water by Ultraviolet Radiation 1670
C. B. Kelly

The Home Care Program of the Detroit Visiting Nurse Association 1681
Sylvia Peabody, R.N.

Optometry's Role in Health Maintenance—A Study of Referrals 1688
Galen F. Kintner, O.D.

The Learning Process 1694
Robert J. Havighurst, Ph.D.

Psychological Basis of Human Behavior 1699
Andie L. Knutson, Ph.D.

Social Determinants of Health Practices 1709
Gordon Macgregor, Ph.D.

Nutrition Education in Public Health Programs—What Have We Learned? . 1715
Anne Burgess, M.B., Ch.B.

Continued on page iv

Articles, continued

PAGE

State Personal Care Services—Observations on the Organizational Future . . 1727
Richard T. Frost, Ph.D.

Public Health Law or the Interrelationship of Law and Public Health Administration 1733
Robert H. Hamlin, M.D., M.P.H.

Administrative Aspects of a State-Wide Rheumatic Fever Prophylaxis Program 1738
George H. Agate, M.D., M.S.P.H.

Journal Departments

EDITORIALS:

Conservative Medicine 1741

Pneumoconiosis Among Pennsylvania Coal Miners 1742

Letter to the Editor:

Harold S. Adams (Re: Editorial—"A Model Act for Registration of Sanitarians." July, 1961) 1743

News of Affiliated Societies and Branches 1745

Employment Service 1753

Book Reviews 1757

Books Received 1761

A Selected Public Health Bibliography with Annotations 1762
Raymond S. Patterson, Ph.D.

Credit Lines 1766

News from the Field 1770

Conferences and Dates 1774

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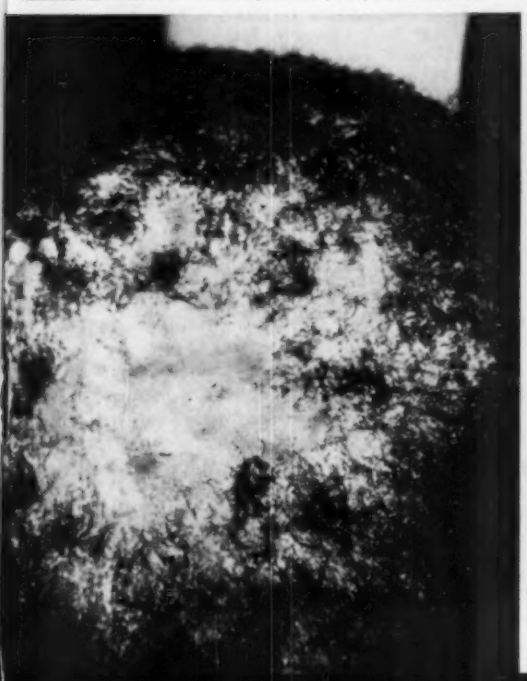

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INDEX TO ADVERTISERS

	Page
American Public Health Association:	
Book Service .....XII, XXXV, XXXVII, XXXVIII, XXXIX	
Membership Application Blank	XXXIX
American Bottlers of Carbonated Beverages	XXXII
American Can Company	XXVI
Baltimore Biological Laboratory, Inc. (Division of Beckton-Dickinson Laboratories, Inc.)	II
Coca-Cola	XL
Consolidated Laboratories, Inc.	XXXIX
Corning Glass	X
Difco Laboratories	Back Cover
Directory of Health Service	XXXV
Black & Veatch	
Dickman Laboratories	
Hedenburg and Venable	
Newing Laboratories, Inc.	
Professional Examination Service, APHA	
Eaton Laboratories	XI
Englehard Hanovia, Inc.	XXXV
Exposition Press	1774
Fiske Associates, Inc.	VI
Hafner Publishing Company, Inc. ..	XIV
Hoffmann-LaRoche Inc.	XLII
International Labor Office	XXXVIII
Kimble Glass Company	VIII, IX
LaMotte Chemical Products Co. ...	XXXV
Lederle Laboratories, American Cyanamid Co.:	
Biologicals	XXX
Tine Test	XXII, XXIII
Leitz, E., Inc.	XLI
Lilly, Eli & Co.	XIII
McGraw-Hill Book Company, Blakiston Division	XXXI
Norcliff Laboratories	XXVII
Olin Mathieson Chemical Corporation (Mathieson Chemicals)	XVIII
Panray Corporation	XLIII
Parke, Davis & Co.	XXI
Pfizer Laboratories Division, Chas. Pfizer & Co., Inc.:	
Diabinese	XXIV, XXV
Tetracyn	XVI, XVII
Viocin	XXXIV
Powers X-Ray Products, Inc.	XXXVIII
Roche Laboratories, Division of Hoffmann-LaRoche Inc.	XV
Ross Laboratories	XX
Schering Corporation	V
Searle, G. D., & Company	VII
Squibb, E. R., & Sons	XXVIII
Upjohn Co., The:	
Medrol Medules	XXIX
Orinase	XIX
Wheat Flour Institute	XXXIII

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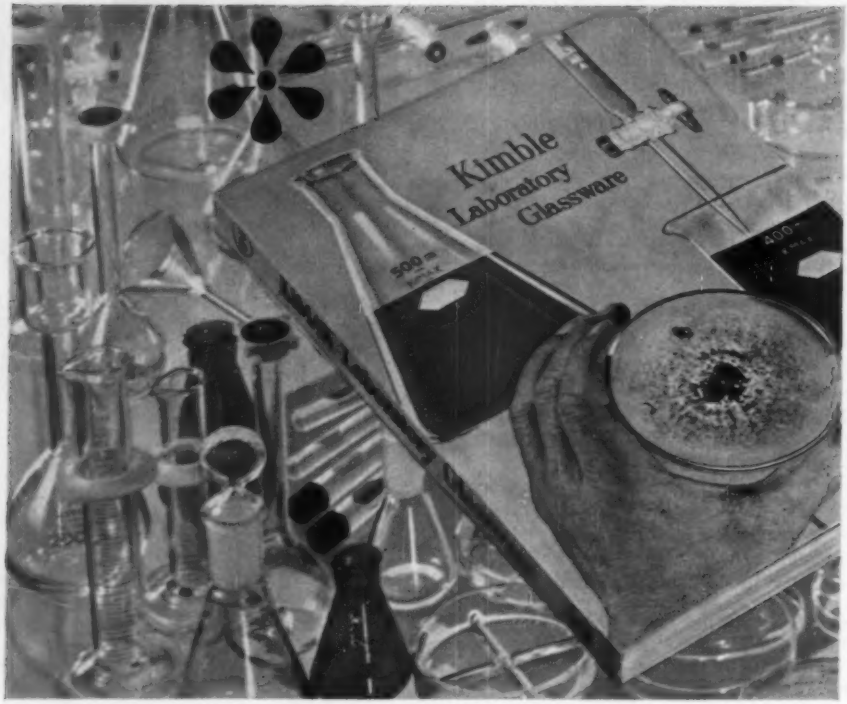

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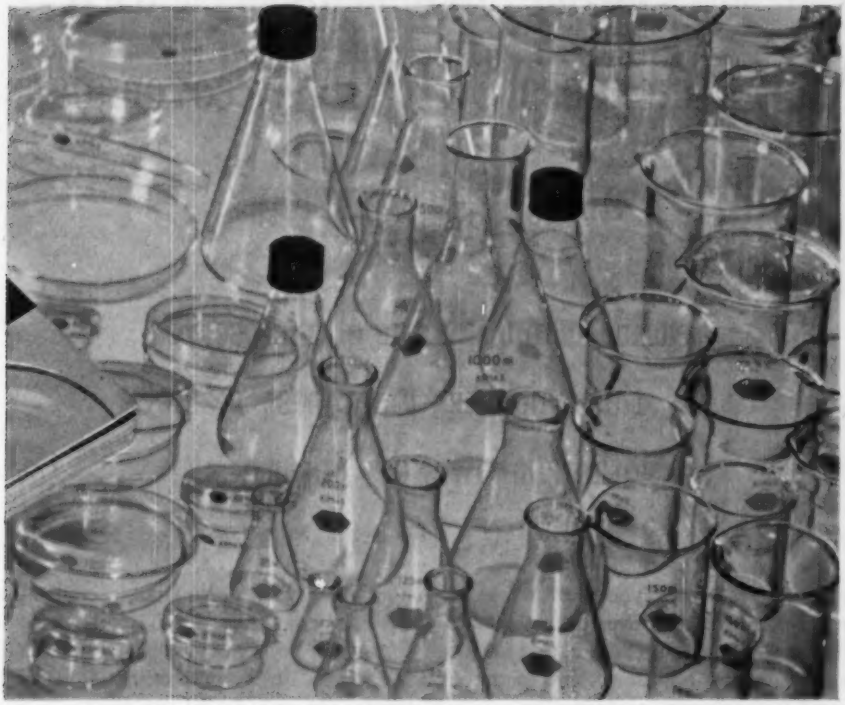

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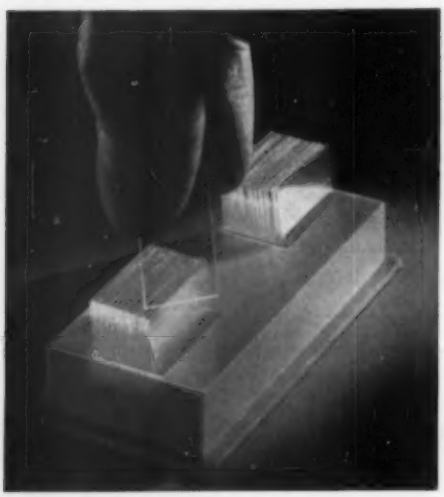

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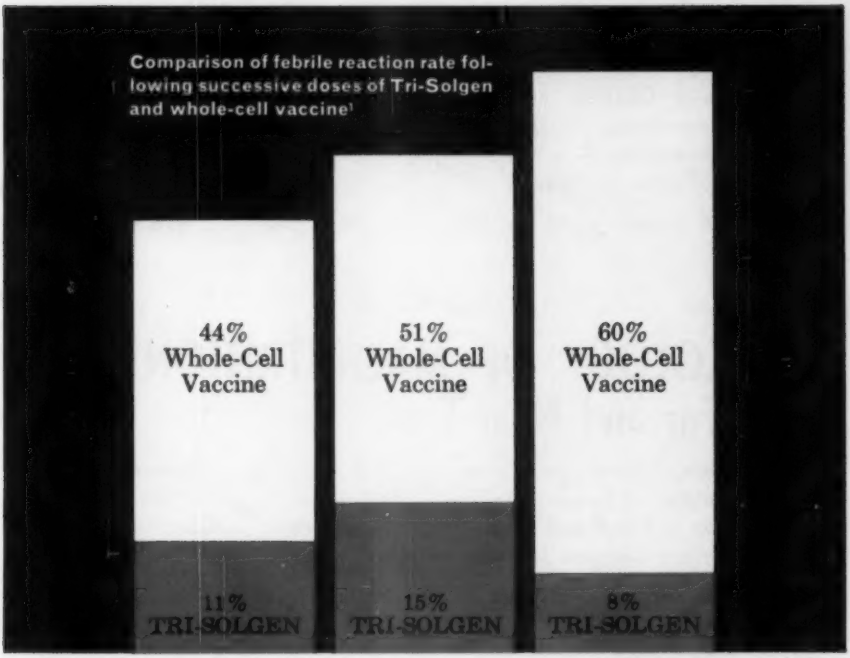
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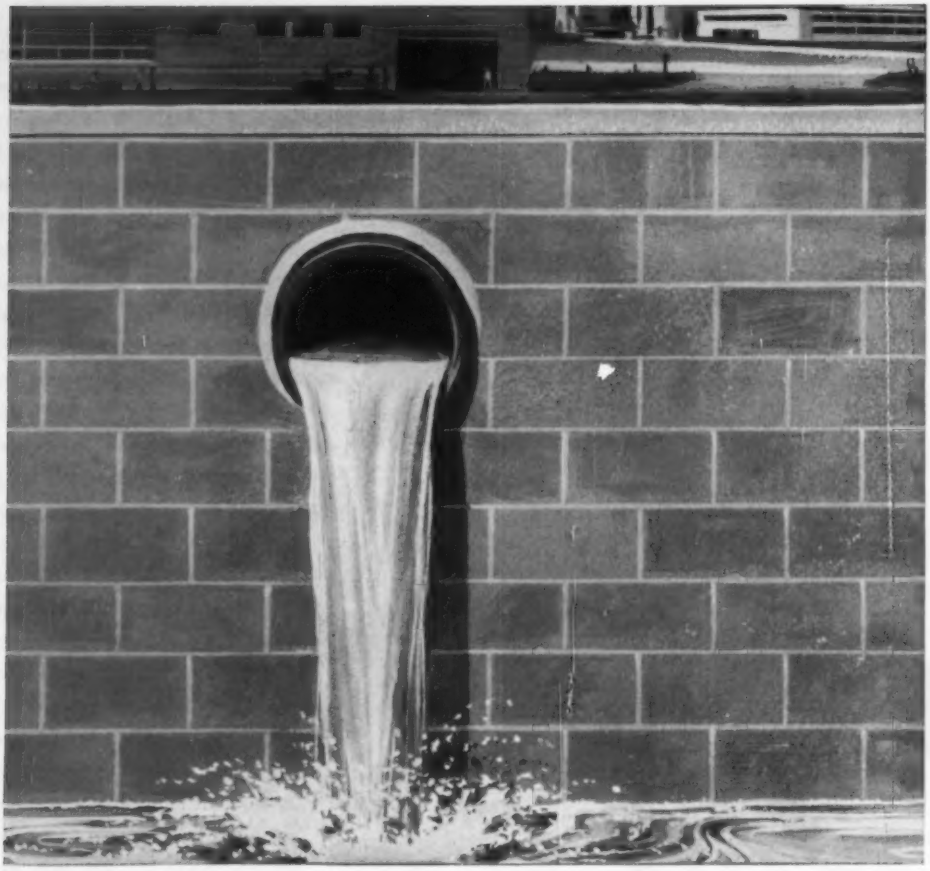

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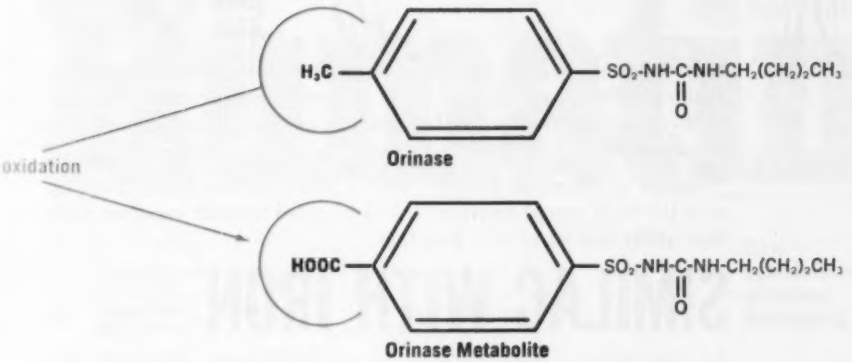

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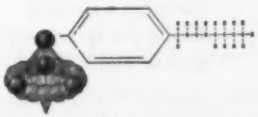

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Patients receiving insulin (less than 20 units)—discontinue insulin and institute Orinase: (20 to 40 units)—initiate Orinase with a concurrent 30 to 50% reduction in insulin dose with a further careful reduction as response to Orinase is observed; (more than 40 units)—reduce insulin by 20% and initiate Orinase with a further careful reduction in insulin dosage as response to Orinase is observed. In candidates for combined Orinase-insulin therapy, an individualized schedule is usually obtainable during a trial course of two or more weeks.

Contraindications and side effects: Orinase is contraindicated in patients having juvenile or growth-onset, unstable or brittle types of diabetes mellitus; history of diabetic coma, fever, severe trauma or gangrene.

Side effects are mild, transient and limited to approximately 3% of patients. Hypoglycemia and toxic reactions are extremely rare. Hyposlycemia is most likely to occur during the period of transition from insulin to Orinase. Other untoward reactions to Orinase are usually not of a serious nature and consist principally of gastrointestinal disturbances, headache, and variable allergic skin manifestations. The gastrointestinal disturbances (nausea, epigastric fullness, heartburn) and headache appear to be related to the size of the dose, and they frequently disappear when dosage is reduced to maintenance levels or the total daily dose is administered in divided portions after meals. The allergic skin manifestations (pruritus, erythema, and urticarial, morbilliform, or maculopapular eruptions) are transient reactions, which frequently disappear with continued drug administration. However, if the skin reactions persist, Orinase should be discontinued.

Clinical toxicity: Orinase appears to be remarkably free from gross clinical toxicity on the basis of experience accumulated during more than four years of clinical use. Crystalluria or other untoward effects on renal function have not been observed. Long-term studies of hepatic function in humans and experience in over 650,000 diabetics have shown Orinase to be remarkably free of hepatic toxicity. There has been reported only one case of cholestatic jaundice related to Orinase administration, which occurred in a patient with pre-existing liver disease and which rapidly reversed upon discontinuance of the drug.

Each tablet contains:
Tolbutamide ..... 0.5 Gm.

Supplied: In bottles of 50.

*Trademark, Reg. U.S. Pat. Off.—tolbutamide, Upjohn

June, 1961

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The Upjohn Company, Kalamazoo, Michigan

Upjohn 75th year

investigators find

among clinic infants- at least 30% are iron-deficient[1,2]

Iron deficiency among infants is of particular importance in public health practice, since this deficiency is more prevalent among children of lower income families; the frequency in underprivileged groups may become alarming.[3]

"Because of the rapid growth...even a good diet can barely keep up with the body's need for iron."[4] And even babies with excellent diets show many indices of iron depletion.[3]

iron deficiency is easily prevented

SIMILAC WITH IRON®

12 mg of ferrous iron per quart of feeding

An iron intake of approximately 1.5 mg/kg of body weight per day assures "an adequate supply for most growing infants and children."[5] For infants starting on a full diet of solids, Similac With Iron, providing 12 mg per quart, supplies enough iron to offset the depleting effects of growth and to build up stores for the demands of later infancy.

at no increase in cost

Similac With Iron providing physiologic feeding with built-in iron and essential vitamins in adequate amounts costs no more than whole cow milk, and in many areas actually costs less.

following the first formula when iron reserves are being depleted

1. Lahey, M. E.: Am. J. Clin. Nutrition *5*:516 (Sept.-Oct.) 1957. 2. Sturgeon, P., in Metabolism and Function of Iron, Report of the 19th Ross Pediatric Research Conference, Fomon, S. J., ed., Columbus, Ohio, Ross Laboratories, 1956, p. 92. 3. Schulman, I.: J.A.M.A. *75*:118 (Jan. 14) 1961. 4. Eagle, J. F.: New York J. Med. *60*:1821 (June 1) 1960. 5. American Academy of Pediatrics Committee on Nutrition: Pediatrics *26*:715 (Oct.) 1960.

ARE YOU RECEIVING **CURRENTS IN PUBLIC HEALTH?**

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FOR PROVEN EFFICACY IN INFECTIOUS DIARRHEAS

Humatin® KAPSEALS

(paromomycin, Parke-Davis)

A WELL-TOLERATED ANTIBIOTIC-AMEBICIDE

HUMATIN possesses high antibacterial and antiamebic activities, coupled with a low order of oral toxicity.[1] Because it is effective against many gram-negative pathogens, HUMATIN has proved valuable in the treatment of infectious diarrheas and other enteric infections, most of which are caused by bacilli of the gram-negative group.[2-5] Characteristic of the favorable response to HUMATIN is a prompt reduction in the number of stools per day, a decrease in fever, and rapid alleviation of other symptoms of infection.[2,3,5] HUMATIN is also useful in all phases of intestinal amebiasis,[1,5-12] and has shown promise of being useful in the preoperative suppression of intestinal flora,[5] and in the adjunctive management of hepatic coma.[13-15]

HUMATIN is not appreciably absorbed from the gastrointestinal tract and is, therefore, not effective against systemic infections. Systemic toxicity has not been a problem. *See medical brochure for details of administration, precautions, and dosage.*

SUPPLIED: HUMATIN (paromomycin, Parke-Davis) is available as the sulfate in Kapseals,® each containing the equivalent of 250 mg. of base, in bottles of 16.

REFERENCES: (1) Coffey, G. L., *et al.: Antibiotics & Chemother.* 9:730, 1959. (2) Courtney, K. O.; Thompson, P. E.; Hodgkinson, R., & Fitzsimmons, J. R.: *Antibiotics Annual* 7:304, 1959-1960. (3) Godenne, G. D.: *ibid.*, 310. (4) McMath, W. F. T., & Hussain, K. K.: *Pub. Health* 73:328, 1959. (5) Personal Communications to Department of Clinical Investigation, Parke, Davis & Company, 1959. (6) Shafei, A. Z.: *Antibiotic Med. & Clin. Therapy* 6:275, 1959. (7) Lopez Elias, F., & Oliver-Gonzalez, J.: *Antibiotic Med. & Clin. Therapy* 6:584, 1959. (8) Carter, C. H.: *Antibiotic Med. & Clin. Therapy* 6:586, 1959. (9) Thompson, P. E., *et al.: Antibiotics & Chemother.* 9:618, 1959. (10) Dooner, H. P.: *Antibiotic Med. & Clin. Therapy* 7:486, 1960. (11) Coles, H. M. T., *et al.: Lancet* 1:944, 1960. (12) Moffett, H. F., & Toh, S. H.: *Antibiotic Med. & Clin. Therapy* 7:569, 1960. (13) Fast, B. B.; Wolfe, S. J.; Stormont, J. M., & Davidson, C. S.: *Arch. Int. Med.* 101:467, 1958. (14) Mackie, J. E.; Stormont, J. M.; Hollister, R. M., & Davidson, C. S.: *New England J. Med.* 259:1151, 1958. (15) Stormont, J. M.; Mackie, J. E., & Davidson, C. S.: *New England J. Med.* 259:1145, 1958.

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PARKE, DAVIS & COMPANY, Detroit 32, Michigan

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Each unit contains one complete tuberculin test: a plastic holder with stainless steel disc and 4 tines coated with Old Tuberculin and dried. Except for cleaning the site with alcohol, no preparation, clean-up or other materials are needed. Reactions, read 48-72 hours later, can be readily identified and measured accurately.

A series of tests* performed in tuberculosis hospitals confirmed the accuracy of the Tuberculin, Tine Test compared with the Mantoux. In one group of 942 Mantoux positives, 97.8 per cent were positive by the Tine Test. Among another group of 436 bacteriologically proven cases, 97.7 per cent were positive by the Mantoux Test and 97 per cent by the Tine Test.

For industrial, school or community programs, the LEDERLE TUBERCULIN, TINE TEST offers distinct advantages in speed, accuracy and economy.

Supplied: Box of 25 test units.

*Russell, W. F., Jr.; Lynch, H. J.; Doto, I., and Furcolow, M. L.; Comparison of Tuberculin Skin Reactions: Tine Test vs. Intracutaneous, Scientific Exhibit, 110th Annual Meeting, A.M.A., New York, June 26-30, 1961.

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(Rosenthal)

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LEDERLE LABORATORIES, A Division of American Cyanamid Company, Pearl River, New York

FOR YOUR CHRONIC DISEASE PROGRAM

an oral antidiabetic providing long-term effectiveness and convenient, economical once-a-day dosage

IN BRIEF

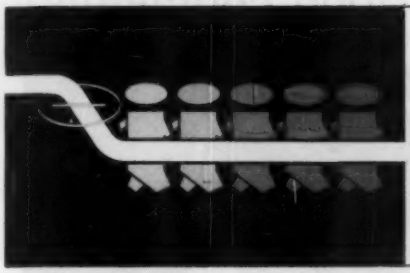
DIABINESE, a potent sulfonylurea, provides smooth, long-lasting control of blood sugar permitting economy and simplicity of low, once-a-day dosage. Moreover, DIABINESE often works where other agents have failed to give satisfactory control.

INDICATIONS: Uncomplicated diabetes mellitus of stable, mild or moderately severe nonketotic, maturity-onset type. Certain "brittle" patients may be helped to smoother control with reduced insulin requirements.

ADMINISTRATION AND DOSAGE: Familiarity with criteria for patient selection, continued close medical supervision, and observance by the patient of good dietary and hygienic habits are essential.

Like insulin, DIABINESE dosage must be regulated to individual patient requirements. Average maintenance dosage is 100-500 mg. daily. For most patients the recommended starting dose is 250 mg. given once daily. Geriatric patients should be started on 100-125 mg. daily. A priming dose is not necessary and should not be used; most patients should be maintained on 500 mg. or less daily. Maintenance dosage above 750 mg. should be avoided. Before initiating therapy, consult complete dosage information.

SIDE EFFECTS: In the main, side effects, e.g., hypoglycemia, gastrointestinal intolerance, and neurologic reactions, are related to dosage. They are not encountered frequently on presently recommended low dosage. There have been, however, occasional cases of jaundice and skin eruptions primarily due to drug sensitivity; other side effects which may be idiosyncratic are occasional



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diarrhea (sometimes sanguineous) and hematologic reactions. Since sensitivity reactions usually occur within the first six weeks of therapy, a time when the patient is under very close supervision, they may be readily detected. Should sensitivity reactions be detected, DIABINESE should be discontinued.

PRECAUTIONS AND CONTRAINDICATIONS: If hypoglycemia is encountered, the patient must be observed and treated continuously as necessary, usually 3-5 days, since DIABINESE is not significantly metabolized and is excreted slowly. DIABINESE as the sole agent is not indicated in juvenile diabetes mellitus and unstable or severely "brittle" diabetes mellitus of the adult type. Contraindicated in patients with hepatic dysfunction and in diabetes complicated by ketosis, acidosis, diabetic coma, fever, severe trauma, gangrene, Raynaud's disease, or severe impairment of renal or thyroid function. DIABINESE may prolong the activity of barbiturates. An effect like that of disulfiram has been noted when patients on DIABINESE drink alcoholic beverages.

SUPPLIED: As 100 mg. and 250 mg. scored chlorpropamide tablets.

CAUTION: Federal law prohibits dispensing without prescription.

More detailed professional information available on request.

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Through exhaustive studies, Canco scientists assure the safety of materials used in food containers

Safety of container-making materials is assured through comprehensive tests in the Canco research laboratories. Screening tests are made to determine the suitability of all new materials being considered for metal, fibre, or plastic food containers.

Tests are designed to develop information important to the U. S. Food and Drug Administration. Preliminary screening tests generally involve short-term feeding studies with rats or guinea pigs. Data from these tests and details as to intended commercial use for the material are then presented to the regulatory authorities for evaluation. If additional information is considered desirable, this is obtained in a two-year feeding study using monkeys and other experimental animals.

In this manner Canco determines the acceptability of its container materials from a public health standpoint. In two papers (1, 2) a typical evaluation program is discussed in detail. These publications are available upon written request to Dept. E, American Can Company, Research Center, Barrington, Illinois.

REFERENCES: (1) Ives, M. Safety Evaluation of Food Packaging Materials. *Journal of the American Dietetic Assoc.*, (Apr. '57)
(2) Ives, M., and Dack, G. M. Safety of Inside Enamel Coatings Used in Food Cans. *Food Research*, (Jan. '57)

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In the treatment of **PEDICULOSIS...**
(capitis and pubis)

Here it is! A pleasant parasiticide that kills lice and nits without sting, stain or "smell"

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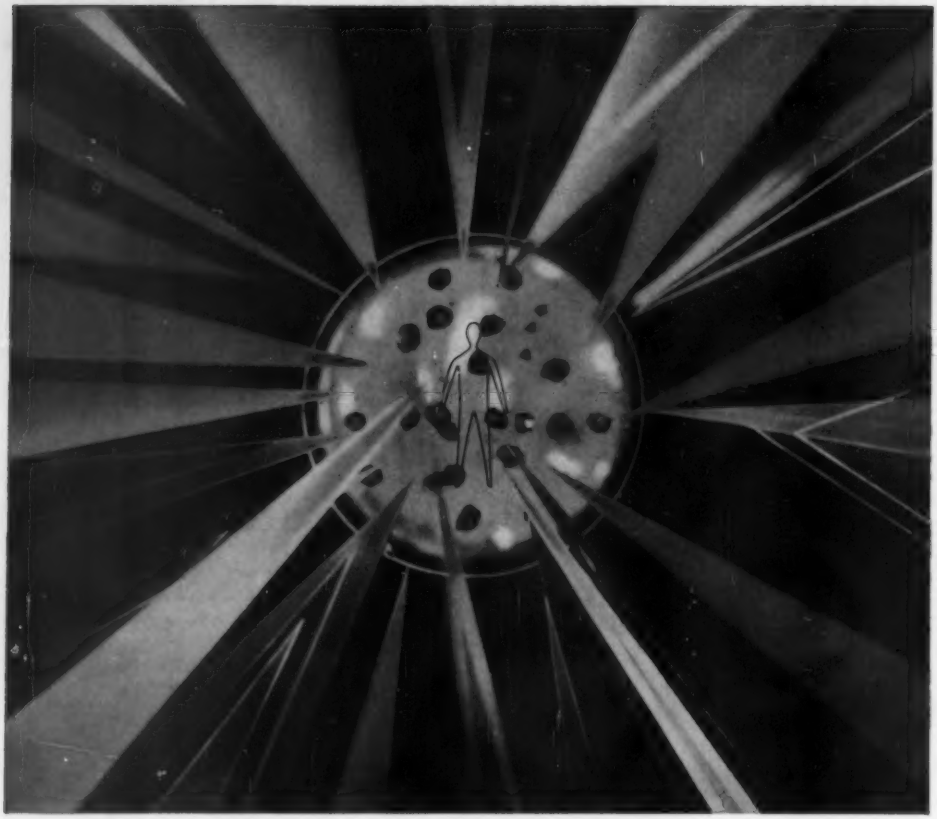

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The slow, steady release of methylprednisolone often provides greater effectiveness, with less frequent administration and sometimes a reduced total daily dosage.

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Dosage: The following dosages are recommended in rheumatoid arthritis:

	Initial	*Maintenance*
Severe	12 to 16 mg.	6 to 12 mg.
Moderately severe	8 to 10 mg.	4 to 8 mg.
Moderate	6 to 8 mg.	2 to 6 mg.
Children	6 to 10 mg.	2 to 8 mg.

With Medrol Medules, it may be possible to reduce the total daily dose by ⅓.

Indications and effects: Medrol benefits (anti-inflammatory, antiallergic, antirheumatic, antileukemic, antihemolytic) have been demonstrated in acute rheumatic carditis, rheumatoid arthritis, asthma, hay fever and allergic disorders, dermatoses, blood dyscrasias, and ocular inflammatory disease involving the posterior segment.

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Approximately 135 tiny "doses" mean smoother steroid therapy

Medrol* **Medules***

Each capsule contains: Medrol (methylprednisolone) 2 mg. or 4 mg.
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Lederle immunizing agents reflect the tradition of constant research to discover the new and improve the old. A case in point: Lederle Smallpox Vaccine is now produced from vaccinia virus cultured in chic embryos—a radical change—for the better—from the older calf lymph technique. The result: an AVIANIZED® vaccine with lessened danger of excessive scarring or secondary infection... a superior vaccine for routine use...and far more quickly obtainable in quantity to meet a public health emergency...Other Lederle immunologic agents—

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The Role of Physicians and Public Health Workers

Prepared under the direction of the *Program Area Committee on Accident Prevention* and authorized for Publication by the *Technical Development Board of the American Public Health Association.* Editorial Consultant: MAXWELL N. HALSEY

Accidents don't happen: they are caused . . . is the theme throughout this new book. ACCIDENT PREVENTION, the first work of its kind to bring together the concerted thinking of experts in various fields of accident causation, will serve as a valuable reference volume for physicians and public health workers. This book places before the reader the pertinent facts and data on safety and accident prevention that have been recently developed.

This book stresses practical approaches to the accident prevention problem with the material presented against a backdrop of the basic principles involved. Some of the more important recent advances covered are: the role of alcohol in traffic accidents, the role of physiological and psychological factors, off-the-job safety, seat belts, methods of evaluating results, etc. Emphasis is also placed on such environment factors in accident causation as roads, equipment, and weather in traffic accidents; or structural detail, household appliances, and lighting in home accidents.

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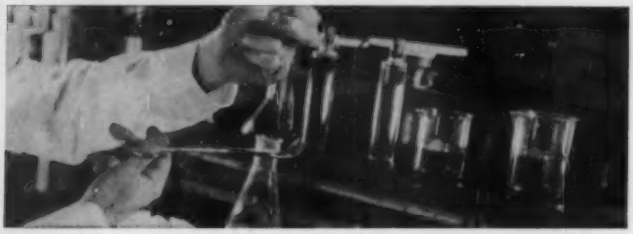

Research* shows why

Soft Drinks DO NOT AID

Cariogenic Enzymatic Activity

The two important factors in judging the caries-producing potential of a food are: (1) its form and (2) the amount of time it is in the mouth.

Recent dental research* makes it apparent that liquids pass so rapidly through the mouth they leave only minimal residue on gums and teeth. Therefore liquids provide little chance for caries-related action.

Specifically, soft drinks are found to have virtually no relationship to oral conditions involved in the acidogenic theory. They may be enjoyed for their purely beneficial qualities—encouraging liquid intake, vital for maintaining body fluid balance; providing quick energy; stimulating appetite by aiding digestion.

*Shaw, Jas. H., Caries-producing Factors; a Decade of Dental Research, J. Am. Dent. A., 55:785 (Dec.) 1957.

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American Bottlers of Carbonated Beverages

Washington 6, D.C.

The Two Minute Story of the Quiet Miracle

A quiet miracle?

Since 1941, practically all cereal foods in U.S. diet have been enriched. B-vitamins—thiamine, niacin and riboflavin—as well as food iron have been added to bread, flour, processed cereals, white rice, corn meal and macaroni foods—without changing taste or color . . . without adding calories or cost.

Since 1941, deficiency diseases caused by diet inadequate in thiamine, niacin and riboflavin have all but disappeared. The occurrence of iron deficiency anemia has been materially reduced. Enrichment accomplished a quiet kind of miracle—to bring better health to all through better nutrition for all. In the American tradition, enrichment was voluntary —the combined work of science, medicine, government and industry.

Philosophy of enrichment

In 1939, the American Medical Association recommended adding synthetic nutrients to general purpose foods to make up deficiencies in popular diet. By that time, scientific and industrial research made enrichment not only possible but commercially practical. Nutritionists were alarmed by surveys showing great public need for certain nutrients.

The fortification of margarine with vitamin A; milk with vitamin D; table salt with iodine; the restoration of breakfast cereals; and enrichment of bread, flour and similar foods have since resulted. The addition of these needed vitamins, minerals and other dietary essentials to general purpose foods was urged in the interest of public health.

History of enrichment

Even in 1939, some bakers and millers were adding B-vitamins, non-fat dry milk and sometimes vitamin D to improve their products nutritionally. But definition and agreement were needed.

After many hearings, the term "enriched" was adopted by the U.S. Food & Drug Administration to describe the addition of specified amounts of thiamine, niacin, riboflavin and iron to popular cereal-based products. Enrichment standards were issued May 27, 1941, and later amended as enrichment was made mandatory for the duration of the War. Since 1946, enrichment laws have been adopted by more than half the states. Today it is estimated that 80 to 90 percent of all breadstuffs, family flour and macaroni foods are enriched.

Public health benefits

Beriberi, pellagra and ariboflavinosis are related diseases caused by diet deficient in thiamine, niacin, and riboflavin. Once common ailments, they affect heart, mind, skin and nervous system. Since enrichment, they have almost disappeared. Physicians now rarely find evidence of beriberi, pellagra or riboflavin deficiency, even in chronic alcoholics among whom these diseases were formerly prevalent. The occurrence of iron deficiency anemia has also been lessened.

Credit for this revolutionary achievement . . . this quiet miracle in public health . . . in nutrition . . . has been given the enrichment program and those who made it possible.

Benefits—to you and your family

Improved public health means better family and personal health. Through enrichment—bread and other products of flour and wheat have been made so nutritious that they can improve any normal diet —even those designed for weight reduction. Low in fat and not excessive in calories, enriched products contribute generous supplies of thiamine, niacin, riboflavin and iron to our national food supply. Enrichment makes U.S. bread nutritionally the best in history . . . one of the best breads in the world today. Always look for the word "ENRICHED" on the label of the bread, flour, corn meal, rice, macaroni or other cereal products you buy.

ENRICHED . . .

and whole wheat flour foods are listed among the "Essential Four" food groups set up by the U.S. Dept. of Agriculture's Institute of Home Economics. Diet selected from these foods provides ample protein, vitamins and minerals.

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working for a healthier America through nutrition

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The nutritional statements made in this advertisement and the leaflet have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current, authoritative medical opinion.

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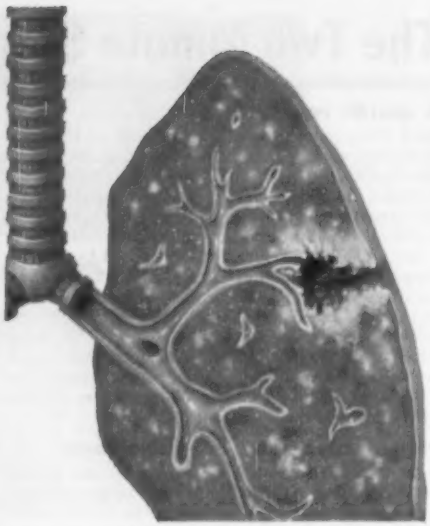
an effective agent in pulmonary tuberculosis[1]

VIOCIN®
viomycin sulfate

when tuberculosis resists standard therapy... especially valuable during and after surgery



IN BRIEF

Viomycin sulfate (VIOCIN) is the crystalline salt of an antituberculous antibiotic derived from the actinomycete, Streptomyces puniceus. In patients resistant to routine agents, VIOCIN provides significant therapeutic effect, particularly in combination with other antituberculous agents. VIOCIN protects against operative complications and is apparently ***not cross-resistant with streptomycin or isoniazid.***

INDICATIONS: As an adjunct in the treatment of progressive exudative, hematogenous lesions and the pneumonic type of pulmonary tuberculosis; cutaneous tuberculous lesions and fistulas; tuberculous lymphadenitis; tracheobronchial and laryngeal tuberculosis; alimentary, peritoneal, genitourinary, meningeal, miliary, and bone and joint tuberculosis; and postoperatively in thoracic surgery on tuberculous patients. It is useful prophylactically in operations such as lobectomy and pneumonectomy for pulmonary tuberculosis.

ADMINISTRATION AND DOSAGE: VIOCIN should be administered by *deep* intramuscular injection, preferably into the gluteal, thigh, or deltoid muscles. The dosage employed for most forms of tuberculosis is 2 Gm. (given in two doses of 1 Gm. each, 12 hours apart) every third day, usually in combination with PAS (12 Gm. daily by the oral route). Therapy should be continued for at least four to six months. Daily administration of VIOCIN should never exceed 2 Gm. and should never be given continuously for more than one month.

SIDE EFFECTS: The toxicity of VIOCIN is related chiefly to dosage. When recommended dosages are used, toxic reactions are unlikely to occur with any degree of frequency or severity. They may occur in occasional individuals, however, and the following reactions should be watched for in all patients receiving the drug: renal irritation, disturbances of the eighth cranial nerve, allergic reactions and eosinophilia, electrocardiographic abnormalities, edema and fluid retention, and disturbances in the serum electrolyte pattern.

PRECAUTIONS AND CONTRAINDICATIONS: VIOCIN should be used under the close supervision of the physician, and should not be used when routine measures (as in minimal or primary pulmonary tuberculosis) or other drug therapy (streptomycin, isoniazid, PAS, either singly or in combination) would be effective. Like other antituberculous agents, VIOCIN is of relatively little value in the therapy of extensive caseous or fibrotic lesions. Patients with impaired renal function should receive lower dosages and be carefully watched for signs of toxicity. The similar nature of the toxic manifestations of streptomycin and VIOCIN suggests that these two drugs should not be used concomitantly except when the potentialities of other drug combinations have been exhausted. They should not be used on the same day, and the higher dosage ranges should be avoided.

SUPPLIED: In vials containing the equivalent of 1 Gm. or 5 Gm. viomycin as the sulfate. Diluent to be added.

More detailed professional information available on request.

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Man's environment has changed profoundly in the last three decades and the technological developments that have brought this about will increasingly affect most of the world. These effects are still little understood, and indicate the direction in which a major part of public health work will have to be directed. (This is the part of the Association Symposium devoted to man's physical environment. The section devoted to the social environment appeared in the July issue.)

MAN AND HIS CHANGING ENVIRONMENT

THE CHANGING PHYSICAL AND BIOLOGICAL ENVIRONMENT OF MAN

Abel Wolman, Dr.Eng., F.A.P.H.A.

THE PAST several decades have been characterized in contrasting terms, depending upon the optimism or cynicism of the observer. We live in an era of profound change, whether such change is measured in biophysical terms or in the stresses of social and political reconstruction. It is a time of great conflict between scientific development and social and political adaptation.

Whatever the choice of philosophy, the world presses upon man the necessity for accepting change and the challenges and hazards which necessarily accompany it. Because man faces significant issues with no obvious solutions does not detract from the fact that this is still a golden era of intellectual opportunity. Charles V. Chapin, half a century ago, aptly phrased the health officer's obligation to adjust to change in the following terms:

"To do our duty day by day is, indeed, a pleasure, to abate nuisances, to isolate contagious diseases promptly, to examine school children, to license hogs, to listen patiently to complaints, to diagnose doubtful cases, to record births and deaths, to distribute milk for babies, to vaccinate, to kill mosquitoes, give out antitoxin, to inspect baby farms, to examine dogs' brains, to distribute circulars,

to make blood tests, to back up the family physician, to keep the reporters good-natured, to answer fool questions, are all in the day's work. . . . But the health officer however faithful, who gets into a rut is not doing his full duty."[1]

Characteristics of Our Age

When one deliberately attempts to assay the world in which the public health worker now functions, he will soon discover that no single characteristic is universally applicable. He must consider geography, economic and social period, and the status of disease. This is not a uniform world with a uniform display either of conditions or of hazard. It has been said, for example, that the communicable diseases have wellnigh disappeared, that morbidity is on the increase in certain age groups, that life expectancy has reached perhaps a plateau of some 70 years. These phenomena are true for the most part only in the Western Hemisphere. Most of the statements are equally untrue for more than half of the total population of the globe. One is confronted, therefore, with two worlds of contrasting disease aspect and hence of differing necessities and programs.

For this discussion, I am restricting myself primarily to the Western World and more specifically to the United States of North America. Such a narrowing of geographical scope is essential for the purposes of this symposium. If one were to embrace the world as a whole, each description, each judgment and each prophecy, no matter how circumscribed, would have to be posed in multiple forms.

Innumerable areas of activity may illustrate what has been happening in the environment over the last several decades. Their listing would not only confuse the situation, but detailed documentation is already in print.[2] A few examples for establishing a setting are, however, noted in the following.

Water Supply

The ingenuity of the engineer will be pressed in the next quarter of a century to exercise increasingly skillful control and management of water resources. These resources will be ample for the future if intelligently and logically planned and developed. In the consummation of these tasks central issues are already apparent.

Specific synthetic organic chemicals are one of the major characteristics of our era. They are finding their way increasingly into our public water supplies. They may originate in the wastes of the population, as, for example, in the detergents. Fertilizers, insecticides, and other agricultural poisons provide them on the land. Deliberate application to waters for plant or fish control is not uncommon.

Although we are aware of a mosaic of stable organic materials, our tools of examination and of identification are still much too inadequate to provide the quantitative information necessary either to determine toxic aspects or methods of removal.

Whether a limit exists or will be attained at which human accommodation to such substances may be exhausted is still in the realm of speculation.

Similar concern and confusion are obvious with the assessment of the public health aspects of viruses in the water environment. Here, too, we wait upon improved methods for recovery, identification, enumeration and, particularly, epidemiological assessment of public health significance.

Water Pollution

Excessive abuse of receiving bodies of water from the waste waters which reach them will require increased attention. The reclamation and re-use of waste waters are probably dominant necessities of the future, not only because of acute shortages of fresh water

in some areas, but because of increasing demand and pollution even in fairly rich water areas. The recapture of the once used or spent water supply presents a significant technological challenge. This challenge is unlikely to be met by even the most economic methods for desalting sea water. On the contrary, the cost of reclaiming used fresh water, with a tiny fraction of the soluble materials present in sea water, appears to offer more satisfying prospects.

To the orthodox processes of primary and secondary treatment one may well expect the addition of tertiary and even quaternary degree treatment and polishing of domestic and industrial wastes.

The investigator in this field, therefore, has an exciting future of research. High on the list would be the necessity for greatly improved analytical methodologies, diagnoses of effects of long-term persistence of wastes on water uses, the development of simple and short-term bio-assay procedures, and extensive inquiries into the technics for removal of larvicides, algaecides, piscicides, and other economic poisons.

Air Pollution

Although tremendous progress has been made, particularly in California, in the baffling aspects of air pollution and its control, far more remains to be resolved than has so far materialized from the sharp attention in recent years to the physical and biological sciences, engineering, public health, economics, and the law. For virtually the same reasons as in water supply and in stream pollution, rapid industrialization and urbanization, coupled with the geographical and meteorological disabilities of some areas, have pushed forward more rapidly the necessity for detailed exploration in air pollution than might have been the case in a more leisurely developing technology. The increase in air-borne wastes, with either familiar or new kinds of pollution, plagues the health officer in expanding areas of the country.

As in so many pollution situations, man soon discovers the variability of his so-called natural environment. The Southern Californian who prides himself on the excellent climate pays a price for the meteorological peculiarities which dominate the fate of his industrial and domestic air-borne wastes. Many years ago Horace Walpole touched upon this controlling feature of the environment when he observed that "the French can never have as beautiful landscapes as ours in England, till they have as bad a climate."

Many questions remain unanswered. What standards of air cleanliness are to be maintained and for what reason? What are the effects of air pollution upon man, plant, and animal life? Are they the results of short or long exposure and are they likely to do major harm to biological life? The intuitive assumptions that a polluted atmosphere is not conducive to the best health still lack either strong statistical or epidemiological support. A tremendous amount of painstaking and costly research over a long period of time is to be anticipated.

The details of this specific area of research need not be delineated here except to re-emphasize that knowledge must be extended in clarifying the chemistry of air pollution systems, the chemistry of sulfur compounds, the physiological effects of aerosols in atmospheric reactions, and the physiologic and toxicologic effects of specific pollutants.

Food Technology

The increase in the number and variety of processed foods is considered by some to be synonymous with a better and easier life. It seems to be assumed that most individuals for one reason or another are unwilling to accept foods in their natural state. Hence every conceivable effort has been made to

modify color, taste, structural appearance, texture, stability, nutritive value, and substituted commodities. Such successful efforts to supplement, modify, and conceal nature introduce innumerable problems of identification, of evaluation, of control, and of assessment of long-term biological effects. To the orthodox problems of biological hazards in food, industry has added the major issues of chemical, biochemical, physical, and other adjustments. The natural and artificially induced shifts in food habits, new methods of food technology, and the intentional and inadvertent use of additives find the health officer confronted with a baffling set of conditions unheard of even a decade ago.

Occupational Health

In man's work-environment we find difficulties similar to those encountered in the fields already mentioned. Hundreds of threshold limiting values have already been established in industry to protect man against hazardous chemical, biological, and physical agents. Over the full working lifetime of an individual fewer criteria are at hand, because no one has been willing to assume that the short-term threshold limit values may be applied with safety to lifetime exposures.

The same situation applies with equal force to all of the emerging problems in the field of radiation, whether for medical, industrial, research, or other purposes. On land, on sea, and in the air, these problems will increase and extensive research will be essential in order to arrive at reasonable restrictions for protecting life.

Debate as to the reliability of all of our permissible limits will continue for years. The development of methods for evaluating occupational hazards will press more and more upon us. The responsibility for carrying out these tasks has not yet been fixed, but that the health officer will have and must have a prime position in this responsibility no one can gainsay.

In the decision as to whether man becomes and remains a victim of his own technology or uses it to the advantage of mankind, the members of the American Public Health Association will have much to say. It need not follow that man will be lost in his own machinations. To protect him against his own wisdom and success in industrial application will not be easy, but the health profession certainly cannot sanction failure to control the environment.

Where Do We Go from Here?

Much of the discussion up to this point is really preliminary to the central question—what do we do in this world of a changing environment? That this environment will increasingly impose a hazard must be accepted as a reasonable basis for any new or expanded professional activity.

The mere listing of the baffling problems already confronting us has led some, in answer to where we go from here, to suggest recourse to the psychiatrist. A better alternative must be found than this one of despair. Public health administrative practice throughout history has an impressive record of improvisation to meet the known and the unknown challenges of man's environment. Life has always been a competitive adventure. As Dubos so well points out, "The very process of life is a continual interplay between the individual and his environment, often taking the form of a struggle resulting in injury or disease." That the environment is more complex than it was a half century ago offers no basis for losing heart. That scientific evidence, measurement, and evaluation are far less complete than desired is also no reason for retreat. This has always been the case. Improvement in the health of man in the

19th century, for example, was undoubtedly without the benefit of the best advice which medicine and the germ theory of disease might have provided if knowledge had been at hand. Success antedated precise knowledge.

Another factor in our favor lies in the tremendous capacity which man has exhibited over thousands of years for natural adaptation and for artificial adjustment to his environment.

More and more we are aware of the fallacy of the "doctrine of specific etiology of disease" and of the truth that "Most disease states are the indirect outcome of a constellation of circumstances" (Dubos). The recognition of the impact of external stresses upon man and disease provides the health practitioner with a broader, even though a more difficult, arena for investigation. In such an arena the significant questions are not whether or not scientific investigation should proceed, but what guides the public health worker may be expected to choose in his professional conduct. It is to these guides that much of this symposium perhaps should be devoted.

Choices of Guides for Administrative Action

The public whom the sanitarian serves is often a hard task master. The man on the street and his invariable companion, the social reformer, have an impatience with inaction. The objectionable atmosphere, the unsightly stream, the mysterious tastes and odors of water and food, and the esoteric characteristics of radiation, all demand attention and control. Abstruse explanations of the inadequacies of scientific knowledge, of unexplored epidemiological worlds, and of insufficient data fall upon deaf ears. In such not unfamiliar dilemmas, what should a practitioner in public health do? Some choices are listed for debate. To steer a middle course between the known, the unknown, the less than frank, and the politically expedient is the unhappy but often the successful lot of the health officer.

The Madison Avenue or Propaganda Route

The changing environment has many dramatic features which so easily lend themselves to the "soft sell" in the modern parlance. The use of suggestion, as a mask for scientific ignorance, and of implication, as a substitute for epidemiologic evidence, are great temptations for bolstering budget, for focusing public attention, and for providing action even if ill-defined.

To the scientist this route is obviously highly suspect. To the politician it is a rich method of raising popular interest and hence "getting something done." To the columnist, on the prowl for the dramatic and plausible, if not the accurate, the route is fruitful.

The health officer undoubtedly looks at this guide with a jaundiced eye for fear that the unproved may be a dangerous boomerang weapon. Examples of such discredited recent efforts are all too numerous. Only the threat of libel suits prevents a partial listing here of these abortive pronouncements.

The Statistical Route

John W. Tukey at Princeton University recently referred to the "characterization of a statistician as a man who draws straight lines from insufficient data to foregone conclusions." The biometrician in public health has however a firmer heritage than this. His tools have been eminently useful in providing some underpinning for public health action. This useful route is certainly one to which the health worker will turn in the search for policy support.

The Epidemiologic Route

In much of the attack on the problems of environmental control, the epidemiologist holds important keys. It is

unfortunate that in the past he has not seen fit to put too much investigative effort in the field of which we speak. His long-term devotion to the orthodox problems of communicable disease is understandable. The dependence, however, of the health officer upon wider epidemiologic inquiry into the subtle impact of environment upon man is so great that the investigator should increasingly apply his tools to such areas as the impact of air pollution upon respiratory disease, of minor concentrations of chemical constituents in food and water upon long-term disease, and of the whole virus complex in its relation to environmental routes for disease causation.

The Research Route

Perhaps the outstanding block to a better understanding of the impact of the environment upon man and the more intelligent efforts at control lies in the delayed research exploration of all the factors involved. As always, administrative action waits upon scientific proof. The route is slow, fumbling, and difficult of formulation. As a prime ingredient of ultimate intelligent policy and action it perhaps takes first place. Action obviously will proceed, while the leaven of new scientific discovery perennially and, it is hoped, promptly adjusts day-by-day practice.

The Route of Intuition

A student of public health accomplishment in the past century cannot help but be impressed with many advances in environmental control which preceded scientific verification. In many instances, the lay social reformer was a militant forerunner of the professional public health worker in pressing for major improvement in the physical way of life of masses of people, often in actions unsupported by scientific evidence and on important occasions contrary to such evidence.

Useful results in public health were often obtained by these measures and the failures were perhaps meager prices to pay for the successes. In modern society, so often speeding along an ever wider highway of general welfare, the public acts upon intuition and is impatient of delay in action. There is something to be said for a public policy which demands clean air, clean streams, and decent houses, per se, even if the coefficients of correlation with morbidity and mortality are either nonexistent or of a low order of magnitude.

After all, we are still a long way off from an analytical technic of measurement of the physiologic-psychologic merits of green grass and trees. No biochemical criteria for such an impact upon man appear even in the offing. Yet Sir Arcot Mudaliar of India, at the World Health Assembly in Minneapolis, wisely bemoaned the fact that no health officer included in his official agenda an interest or an influence in preserving or creating open spaces in the rapidly urbanizing areas of the world. Perhaps the engineers who plow under vast green areas for the super-super-highway and who pile brick upon brick in urban and suburban areas devastated by the excavating machine are as subtly destructive to man as our once familiar Typhoid Mary was.

The route of intuition in public health practice deserves dignified appraisal, if for no other reason than it gives free rein to "the driving power of mercy"! (that happy phrase of Sir Arthur Newsholme).

The Integration of Multidisciplines

Major progress in curbing the vicissitudes of a changing environment will require the best that all the scientific disciplines can and will supply. The problems confronting us are not the exclusive jurisdiction for understanding or abatement of any single professional group. The engineer, it is true, has the

age-old obligation of translating concept into structure and facilities, but in performing this significant task he must move forward simultaneously with the physiologist, chemist, physicist, biochemist, and other scientific workers.

The task of centering these disciplines upon the environment is almost completely unfulfilled. There is hardly a health department that provides the setting for such interdisciplinary attack. Such an effort must come within the compass of the sanitarian's thinking, even if the opportunities for such broad approach may be limited to only a few departments of health.

General Summary

The environment of man has changed profoundly in the last quarter of a century. Added to the earlier hazards of living organisms in water, air, and food, our technology has contributed new chemicals, new biologics, new physical contaminants. The effects of these changes upon life are little understood, whether they be long or short term in manifestation. That the changes cannot be ignored by the health practitioner is obvious.

Guides for action are posed for discussion. One or more of these must be accepted for policy and performance. The wise brew of scientific knowledge, epidemiologic verity, public demand, and rare intuition, with the inevitable seasoning of budgetary restraint, will no doubt be the choice.

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HISTORICAL PERSPECTIVE

Fred B. Rogers, M.D., M.P.H., F.A.P.H.A.

EARLIER this year (1960), when King Bhumibol of Thailand participated in dedication exercises of a new laboratory building at the National Institutes of Health, he unveiled a tablet inscribed with words by Louis Pasteur. These prophetic words were written by Pasteur in the last century: "Science and peace will triumph over ignorance and war. Nations will unite, not to destroy but to build, and the future will belong to those who will have done most for suffering humanity." It was appropriate in 1960, at a time of international ferment, that an Oriental leader, son of a Harvard-educated physician, should direct attention to the past through the words of a noble French scientist.

The past hundred years, which we can review briefly for historical per-

spective, produced the germs of modern science and the present-day practice of public health. Louis Pasteur was a prime mover in this "evolutionary century"; his genius for health education was almost as great as his scientific skill. In a recent book, "Mirage of Health" (1959), Pasteur's biographer, René J. Dubos, has emphasized several revolutionary events of a century ago that ushered in concepts which have changed man's life, thoughts, and world.

Pasteur's first paper on the germ theory, the "mémoire sur la fermentation appelée lactique," appeared in 1857—just one month before Charles Darwin in England sent to Asa Gray, an American medical botanist, the famous letter which first stated in precise form the theory of evolution. In the following year Rudolf Virchow, a German physician and social reformer, published "Die Cellularpathologie" (1858). This book, directing attention to the cellular origin of disease, also helped give direction to modern biological sciences. In the 19th century the concept gradually evolved that advances in public health are inextricably entwined with general scientific and social progress.

A milestone in the history of American public health dates from another event of a century ago. In 1860, at Boston, Mass., there assembled the Fourth National Quarantine and Sanitary Convention, last of a series of consecutive annual meetings which had as their purpose the promotion of sanitary science. These sanitary conventions planned to resolve themselves into a national public health association. The Civil War intervened, however, and this aim was not realized until 1872, when the American Public Health Association was organized, in part by men who had attended one or more of the earlier conventions. The practical value of public health benefits appealed early to American minds.

Coming quickly to the 20th century, one is impressed primarily by the speed of discoveries and broad sweep of scientific progress—facts popping like corn in a hot pan! The last 50 years of human history have seen more changes than the 5,000 that preceded them. Each decade has brought innovations exceeding those of previous centuries and created correspondingly new problems—ones that promise to strain existing cultural and technical fabrics. The decade at mid-century marked greater change than any previous one. This period, aptly called the "Decisive Decade," has posed unique problems that demand our attention—this period therefore deserves special consideration. Environmental changes, in part created by man, now challenge his ways of life and his very survival.

We have the advantage of historical sympathy for the past decade—much is still with us in fact or in memory; but we lack true perspective because we know too much—too much that is fragmentary and of an undigested or unparalleled nature. Close on the heels of World War II have come numerous astounding changes in man and his world: the so-called "population explosion"; exploitation of existing and search for new natural resources; marvelous feats of transportation and communication; new strivings for human rights—anticolonialism and anti-imperialism; the establishment of communism as a world power; nuclear fission; and submarine and space exploration. These changes, steady in development yet explosive in newness, add up to a world revolution for man and his environment.

The surging 60's began as the 13th year of the atomic era and the third year of the space era. Nuclear physics and chemistry now study minute matter, and guided missles and rockets probe the unknown in space. Where man formerly marked eras in terms of centuries, he now chalks them off by dec-

ades or single years. We are living in a pivotal period—a fulcrum-like span of human history. Yet, in this age of unparalleled progress, discontent and questioning have accompanied each major discovery. Having rubbed Aladdin's lamp so often recently, we are faced with the responsibility of controlling the Geniis we have called forth. Several areas bear close scrutiny.

Population

In 1860, the population of the United States (33 states) numbered approximately 31 million; a century later (50 states) the count was about 180 million. During the 1940-1950 decade, more people were added to the population than in any other ten-year period of the nation's history. The gain of over 19 million people—more than the total population of 1840—represented a 14.5 per cent increase over the 1940 population. The 1950 census counted over 150 million people; the preceding decade was a remarkable one in terms of natural increase—the excess of births over deaths.

World population in 1950, moreover, appeared to be growing at the unprecedented rate of somewhat more than 1 per cent per year. Some 25 million persons have been added each year in the past decade, that is, at a rate of about 70 thousand daily, and most live longer lives than ever before. About one-third of the present world population—nearly one billion people—now live within the Communist orbit. If the present growth spiral persists, numbers should exceed four billion by 1980—an increase of nearly 50 per cent above the 1950 total. At this rate, by the year 2000 approximately seven billion people will inhabit the earth. (Pessimists already cry, "standing room only!")

Man must alter his physical and social environment to accommodate this unprecedented increase in population. Demographers today pose more questions than can be answered in this brief review. The literary forecasts by Aldous Huxley ("Brave New World"), and George Orwell ("1984") offer serious food for thought concerning the future of a free society. We now hope that man-made progress in technology will adequately compensate for his great increase in number. Nutrition experts already speak of utilizing untapped food potentials in the sea. Subtle new pollutants are already posing threats to health, however, because of undesirable by-products of technological progress.

Water

Just over a century ago, in 1854, Dr. John Snow closed a common water pump in London and saw the district's cholera rate drop dramatically. From this experience came a valuable lesson in public health: disease can be transmitted by polluted water. For decades the United States has prided itself on the purity of its drinking water. Today this boast rings hollow in many places. The rising demands on water supplies and the increased incidence of water pollution by sewage and industrial wastes should stir our complacency. The Public Health Service recently reported: "The problem of keeping enough water clean enough to protect the public health has become enormously complex, difficult and urgent." Our ability to protect water quality has lagged behind the development of numerous petrochemical compounds which now pollute water—various detergents, fertilizers, insecticides, herbicides, and solvents. New municipal and industrial treatment plants must also be built to ease the overloading of present sewage facilities.

Air

In many cities in the United States today, blue skies are less common than

they once were, and smarting eyes and barking cough are frequent complaints. Air pollution by dusts and vapors is widespread, and no respecter of community size. Smogs of nitrous oxides and hydrocarbons of petroleum origin—automobile exhausts included—contaminate the air we breathe. Exposure to such smog results in acute and chronic irritation of air passages in laboratory animals and humans. Scientists are now at work on the effects of smogs on human health and efficiency. The extent of the menace is yet to be accurately determined, but it nevertheless exists and requires attention. The overall pollution problem in 1960 is a bad one, but by 1970 an estimated 75 per cent of the United States population will be jammed into only 10 per cent of the nation's land area, and the danger of environmental contamination will be greater than ever before.

Food

Thanks to modern chemistry, food has never been more abundant, looked more attractive, or tasted better. Thousands of chemicals are used in the processing, storage, and handling of foodstuffs. Most are probably harmless, but the problem of long-range effects—possible chronic poisoning—by certain of these chemicals deserves closer study. Although their presence in food supplies is restricted by law, illegal quantities of such contaminants as insecticides, antibiotics, and hormones do find their way into the American diet. The inspection and enforcement of Food and Drug Administration regulations poses another major problem in public health today.

Radiation

By 1902, seven years after the discovery of x-rays by Roentgen, the cause and effect relationship between exposure to x-rays or to the emanations of radium was clearly recognized. It has been known since the mid-twenties that radiation of germ cells can result in gene mutation, and radiation exposure during embryonic life can result in developmental abnormalities. A few years later, radiation-induced leukemia in mice was observed.

From 1929 to 1940 what is now named the U. S. National Committee on Radiation Protection and Measurement cooperated with the International Commission on Radiological Protection in developing recommendations concerning the maximum permissible exposure of the relatively few adult workers using x-ray machines, radium, and, later, other sources of ionizing radiation. The Atomic Energy Commission, in all its operations, has endeavored to follow these recommendations. The number of people working with or near radiation has increased with each recent year.

Public concern, and concern by scientists other than radiobiologists, with the effects of ionizing radiation on human beings became widespread as a result of the accidental exposure of the Rongelapese to fallout in the spring of 1954 from atomic detonations in the Pacific. In 1956, as a result of the report of the National Academy of Sciences' study on the biologic effects of atomic radiation, this concern spread from the hazards associated with radioactive fallout to include the dangers inherent in the use of radioisotopes and in the coming age of nuclear power production.

The biological factors in the radiation as they relate to society is a difficult problem. It has been invested with emotional and political overtones and poses a future problem basic to human survival. Nuclear energy has presented civilization with perhaps its greatest challenge since the discovery of fire. We have within our grasp an ability

undreamed of a century ago to control our environment. It is a key to almost unlimited power—either a friendly Gulliver or a Frankenstein's monster. What we do with it depends on us. If we are careless with nuclear energy we can injure ourselves seriously; if we grossly abuse it we could probably destroy our present civilization.

In the past, great epidemic diseases such as smallpox, cholera, and typhoid fever were real and terrible visitors. The problem was to seek the cause and eliminate it by sanitation or by immunizing the population to the specific causative organism. With radiation hazards to society as a whole it is otherwise. There are no formidable, pressing effects for which to seek a cause. We can perhaps predict late effects without accurately measuring or clearly identifying the specific cause. Yet each predicted effect may be a tragic one—a deformed or weakened child, leukemia, bone cancer, decreased life span, or premature death.

Summary

In our enthusiasm for the fruits of science, we must not forget Pasteur's plea for humanity in science. Dr. Robert A. Kehoe of the University of Cincinnati has recently warned: "The technology of our time has created a wealth of materials and made available the forces of nature for man's use. At the same time, it has failed to bring to these materials and forces the understanding of their biological effects that will keep them under adequate control. The effort must be made to reduce the gap between technology and biology before it is too late. It is clear that reckless man can turn loose and build up physical forces which may destroy himself and his kind. . . . The new and dangerous environment that man has created for himself now provides a challenge to both curative and preventive medicine—a challenge that requires additional types of medical knowledge, new skills and new settings for application of such knowledge and skills."

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PUBLIC HEALTH AND SOME MAJOR CHANGES OF OUR TIME

N. J. Demerath, Ph.D.

LATELY we in the United States have been hearing much about this nation's "prestige," about the "extension of freedom," about our contest with the Soviets. The campaign oratory—except for a few domestic issues such as medical care for the aged, farm income and agricultural surpluses, and, of course, Cuba, Quemoy, and Matsu—has featured generalities and personal charges and counter charges. All of this, of course, is in the American national campaign tradi-

tion. But one thing seems certain, we do live in a world of swift change, great perils, and big stakes—a "new frontier," as it has been labeled. And no matter who is in the White House, more and better frontiersmen are urgently needed, together with new programs of societal development and human adaptation. These frontiersmen include those who wrestle daily with the problems of metropolitan sprawl and city slums, and the specialists Professor Wolman noted (epidemiologists, statisticians, engineers, educators, health officers, and others—and I would include the psychiatrists). But more than an aggregate of individual specialisms, more than our usual health teams are necessary. We need, as Professor Wolman says, "the integration of multidisciplines."

The frontier which confronts us today is not that of California and the West in the 1800's. However laudable and desirable the virtues of some of our frontier ancestors, ours is not a world for private pillage and coonskin-capped adventurers who would skin the natives and exercise a quick trigger finger, be these adventurers, corporations, nations, or individuals. Instead, it is a world, a frontier, that calls for the joining of ancient virtues with scientific, governmental, and individual human skills so as to create new social contracts, new systems of cooperation, control, and creativity, in the interests of individuals everywhere and of their growing dignity and their capacities for love and freedom.

More particularly, ours is a world, a frontier, where public health work in the future must be coordinated with housing, city planning, industrial location, education, and economic development—here and abroad. To do this, we require new views, new and practical knowledge of the environment of public health. And this, in turn, demands new concepts, new theories, that join biomedical and engineering concepts and skills with those of the social sciences and their applied arts: education, administration, law, social welfare. In short, the reality of health is more complex than the way we now see it or presently understand it. We require new tools of theory and viewpoint, of analysis and action. This, I think, is what Professor Wolman has in mind when he calls for an "integration of multidisciplines."

Here and there we see genuine efforts at multidiscipline syntheses, real efforts to cope comprehensively with total health situations. For example, in St. Louis, at our County Health Department in association with Washington University, we have had for some years a health research program in which health officers, educators, psychiatrists, psychologists, and sociologists have together tackled basic problems of health, styles of life, population analysis, and social mobility through a frame of reference and methodology which no one specialty alone would have produced. This year we have established a Medical Care Research Center, a joint venture of the Jewish Hospital and the University's Social Science Institute, which brings together physicians, nurses, hospital and health administrators, industrial engineers, economists, accountants, and sociologists in a long-term cooperative study of health care and preventive programs, organizations, and processes under the rubric, "Administrative Science and Medical Care." That the center should enlist the support of the NIH (Division of Research Grants) is one more evidence of the NIH interest in more comprehensive theory and methods. The efforts of men like Ross Janney (PHS), Nathan Sinai (University of Michigan), and Abraham Horwitz (Pan American Health Organization) to clarify the relations between economic development, health, and society are exemplary, as are many of the researches and applications reported in

the book "Health, Culture and Community" edited by Benjamin Paul a few years ago. Well and good, but are we doing enough? I think not.

Consider the obstacles to economic development of the less developed areas of the world, as noted by a fellow sociologist. They also constitute obstacles to health development both abroad and, with certain amendments, at home in the United States as well: inadequate numbers of trained and experienced leaders, absence of common values and linked groupings, overurbanization, resurgent nationalism (the United States "must be number 1"), mass disillusionment, prescientific mentality, demographic imbalance.[1] Of such nature are the complexities of the public health environment. Or consider, if you will, the elemental revolutions of our time. We witness, and have been parties to the making of, three fundamental and pervasive changes: (1) the rapid increase in world population, appropriately called "the population explosion"; (2) the vast increase of energy sources which, especially in nuclear form, comprise a vast power source for the annihilation of man or for humane productivity; and (3) the heightened and extended desire for higher levels of living.

From these underlying revolutions follow others: the proliferation of economic development efforts and industrialization, especially in Asia, Africa, Latin America, Soviet Russia, and the Middle East; faster aerial transport and communications; urbanization (growth of cities, "overurbanization" throughout the world no less than in the United States); and the contesting political trends of new nationalism, neutralism, and varied internationalisms. With these vast changes throughout the world each of us is no less involved than we are with their counterparts in the Americas and the United States. For the setting off of these revolutions and for man's adaptive efforts to them, each of us is responsible in our various ways, and not least as workers for public health. We confront the health problems generated by industrial growth and urbanization identified by Professor Wolman: adequacy of supply and pollution of air, water, food; occupational health; and—I would add—mental health viewed in public (society or community) contexts. And though, as he said, there be "two worlds of contrasting disease aspect and of differing necessities and programs," the health problems of cities abroad are made of ingredients very similar to ours in the United States; for example, Mexico City (4,500,000 and growing at an estimated 5 per cent per year); Peking (3,000,000); Bombay (5,000,000); Djakarta (500,000 in 1940, now an estimated 2,000,000); Leopoldville (284,000 before 1954, 355,000 in 1955); Johannesburg (1,607,000 in 1951, 1,825,000 in 1955).[2] Their outcomes, also, will affect conditions of national economic well-being, political cohesion, social change, the international scene and the United States as surely as day follows night.

But as purveyors of modern medicine and health technology to the masses, our gravest responsibility is surely that of population imbalance in relation to economic growth and political order. The long-range historical fact and future is that not until about 1830 was mankind able, after thousands of years, to produce a world population of one billion. Then in another one hundred years, we added the second billion. And now the outlook is for a third billion probably before 1965, four billion by 1980, five by 1990, and six by 2000—barring the intervention of war, pestilence, starvation, or far more contraception than seems likely without large-scale programs to change current attitudes and fertility practices. The problem involved here is that population imbalance is far more than an historical or statistical long-range affair. As Frank Notestein,

president of the Population Council, puts it, the long-range issues

> ". . . form no part of the concern with which alert leaders of the world's densely settled agrarian regions are viewing their problems of mounting population growth. Their interest is immediate and has a vital bearing on the success of their efforts at modernization. . . . The real problems are not those of minimum subsistence in a distant future. They are those of attaining health, education, and relief from gross poverty for all the world in the next few decades . . . . Such aspirations do not include all of man's highest values, but they are prerequisites for most of them."[3]

At the same time there is no prospect for a rapid reduction in fertility. Even with the eventual appearance of a contraceptive that is appropriate, the basic problem remains: to replace traditional desires for large families and many children, desires that are buttressed by some of man's most powerful beliefs and institutions, with stronger desires for fewer births and the advantages thereof.

It has been urged in some quarters that the United States government make fertility control a matter of direct technical assistance programing, though neither party has chosen to present this as a campaign issue, understandably enough. I question the wisdom of any frontal attacks by federal program; however, we can offer many more training opportunities for foreign students to learn to analyze and treat their own problems scientifically. What they conclude and what they say would, I believe, prove far more influential than any advice from us. Also, our efforts should generally be extended through the United Nations. For example, the two UN regional centers (India and Chile) for demographic research and training could well be amplified and expanded with the further cooperation of the United States government and such professional associations as APHA.

In conclusion, public health—with its biomedical, engineering, and social science components—faces a unique, never again challenge. To meet it we need, in our research and action, a creativity, comprehensiveness, sensitivity, understanding of complexity, awareness of "hidden" consequences, and social responsibility, the likes of which we have not had before. To achieve such qualities now, we must work humbly together in pursuit not of prestige (a word derived from the Latin, meaning delusion or illusion) and national power, but of a goal no less than the insurance of man's future on this planet. Only then can we act as new frontiersmen to help establish the preconditions of man's highest values or his survival. Only then will we be granted, deserve, or even be around to enjoy the admiration and esteem of our fellows.

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PUBLIC ADMINISTRATION

Robert G. Webster, F.A.P.H.A.

PROFESSOR WOLMAN has masterfully outlined to us the hazards under which man lives today in a drastically changed environment. Scientific concepts advance much more rapidly than man can accommodate himself to live with them. Our knowledge in scientific fields has out-distanced man's adjustment to living in the new environment created. To survive we cannot become lost in our own machinations. We must go forward even though often into uncharted areas.

The public administrator sits alongside the health officer in viewing the profound nature of the problems in today's society and the paucity of known solutions. Public administration has become a science coincidental with the focusing and pinpointing of other scientific disciplines. The administrator now accepts his responsibility in the operation of a public activity as an expert in the field of management. No longer can administration be considered an incidental function of the program leader. Public administration is the science of operating or managing an activity.

Significant are the many training opportunities for administrators. Health officers can secure specialized training in the technic of "how" to accomplish results no matter what subject area is involved. Such training is mandatory along with the knowledge of the specific subject matter involved.

A competent administrator can relieve the technician, the health officer, or the scientist, freeing them from much of the labor and effort of making the machine run, freeing them for the technical duties in which they are most skilled.

Dr. Wolman has refreshingly stated that we cannot stand still but must do something to survive. Recognition and acceptance of the amazing complexity of the problems in environmental control bring to the public administrator a willingness to support action even though the scientific knowledge is not exhaustive. He can assist with adequate planning which can be used as a justification for fiscal support. As Dr. Wolman so clearly points out, no one has ever written a treatise on the value of green grass, trees, and open spaces, yet our park, beach, and recreation programs have advanced and occupy a preferred status in government planning.

Good public administration also dictates that we work more closely with persons who have other areas of interest. Interdisciplinary action is the only solution to many of the complex enigmas that face man today in dealing with his environment. The conditions under which people work, the vast social welfare efforts, including those of medical care, problems of mental hygiene, food supply, and housing, all demand a joint approach by many groups.

Dr. Wolman has properly emphasized the necessity that all of our thinking must be "seasoned with budgetary restraint," and we must note here the futility of yielding to the temptation of spending money for the purpose of showing activity. It is a common and widespread fallacy to use the lack of an adequate budget as an excuse for inaction. While in some cases this is no doubt a valid explanation, too often we seek money to solve a problem without any clear idea of how the problem can be

solved, anticipating that a refused appropriation will be a defense.

The showing of expenditures aimed at solving a problem is not alone enough. First must come a plan, which when implemented with money and intelligence can approach a problem. Failure to attain a solution may at least yield an "E" for effort, a far more comfortable defense than is available when there has been simply nothing done.

Public administration, even in the absence of definite mileposts, has demonstrated a willingness to support sincere, aggressive, and intelligent effort when the solution is vague and obscure.

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Scientists Wishing Duty Abroad

The National Academy of Sciences-National Research Council is compiling a register of American scientists and other specialists in the biological and physical sciences and related technologies and fields who are interested in the possibilities of assignments abroad for periods ranging from several weeks to two years. This is in anticipation of the growing need for personnel under international programs in which NAS-NRC cooperates.

Assignments vary greatly with respect to location, duration, stipends, and responsibilities. Some require scientists of high competence and reputation for short-term lecturing and consultative duties in one or several countries. Others call for specialists who are available for longer periods, have had experience in certain geographical areas, and are fluent in Spanish or French. Also, under the exchange program authorized by the Fulbright and Smith-Mundt Acts, younger as well as established science educators are welcomed as lecturers at many African, Asian, and Latin American colleges and universities.

Interested persons are asked to fill out a special form, available from the Committee on International Exchange of Persons, 2101 Constitution Avenue, N.W., Washington 25, D. C. The returned form will not constitute an application, but will insure a person's consideration for openings in his field.

This is a comprehensive general survey of knowledge concerning radioactive wastes in the marine environment. Public health responsibilities are discussed, and appropriate sources of information are indicated.

RADIOACTIVE WASTES IN THE MARINE ENVIRONMENT

Robert M. Brown, P.E., F.A.P.H.A., and Donald W. Pritchard, Ph.D.

THE SUBJECT of this paper is one of major interest to the scientific world. It involves several fields of science, each party to the investigations and determinations which must be made to help man live in equilibrium with the benefits and hazards confronting him as he seeks to utilize his newly acquired sources of nuclear energy. Concerned with the problems of radioactive wastes in the marine environment are those scientists who have the unenvied responsibility of disposing of the wastes; the oceanographers; the marine biologists; and the practitioners of public health whose day-to-day responsibilities now include protecting the public from hazards associated with ionizing radiation.

NOTE—In its charge to the Joint Committee on Marine Food Sanitation (with CSSE) in 1957, the Engineering and Sanitation Section Council of the American Public Health Association stipulated, ". . . evaluate the biological and other technical phases of shellfish sanitation which are associated with the discharge of radioactive wastes into harbor areas, estuaries and shellfish producing waters." This has been a task rather difficult to undertake as an organized committee project.

With the objective of meeting the committee's charge in this important area, the chairman solicited the collaboration of Dr. Pritchard in the preparation of this paper. This is offered, therefore, on behalf of the committee, in fulfillment at least in part, of its charge and with sincere appreciation to Dr. Pritchard for his aid in making this presentation possible. Dr. Pritchard has been a major participant in and contributor to the national and international study projects referred to in this paper.

To develop this subject so as to encompass all the areas of science noted is beyond the scope of this presentation. The objective, therefore, is to treat the subject in terms of its public health aspects, endeavoring to place in a truer perspective the challenge presented to those responsible for prevention and control of hazards to public health. In doing this, the associated phases of waste disposal need and technology, oceanography and marine biology will be dealt with only to the degree necessary to achieve a clear understanding of public health significance and responsibility.

Background Reports

Essential to an understanding of the nature and extent of the problems associated with the disposal of radioactive wastes in the marine environment is a thorough review of several excellent reports. These are commended to the public health practitioner as prerequisite background for any administrative or technological activity on his part and, indeed, for an appreciation of the activities of his allied colleagues in this area.

Five of these are publications of the National Academy of Sciences-National Research Council. The first, issued in 1957, deals with the effects of atomic radiation upon oceanography and fisheries.[1] It effectively presents the challenge of the problem and delineates areas

for investigation. The second (1959) deals with problems of selecting sites for the disposal of low-level packaged wastes on the continental shelf[2]; and the third (1960) handles the dispersal into the marine environment of low- or intermediate-level wastes associated with normal operation of nuclear-powered ships.[3] These two reports[2,3] develop in exemplary fashion the nature of problems involved and the difficulties attending their solution; the concepts of oceanography entering into evaluation and resolution; the marine ecological system and various associated biological phenomena involved in uptake and other aspects of radionuclides in the marine environment; and the determination of maximum permissible concentrations of various radionuclides in sea water. The fourth and fifth reports (1960) deal with the biological effects of atomic radiation, the one being a summary of reports of special committees considering the genetic, pathologic, and meteorologic effects of radiation and the general subject areas of the first three NAS-NRC reports just mentioned[4]; and the other a concise report of such effects to the public.[5]

A report (1960) of major significance to those concerned with food supplies and public health is one dealing with radioactive materials in food and agriculture.[6] It was prepared by a special committee convened by the Food and Agriculture Organization of the UN and places in admirable perspective the problems and relative hazards produced by radioactivity in human food from all sources. Marine foods are therefore considered in their proper quantitative and geographic relationships with terrestrial foods. There is included as an appendix to this report a remarkably concise summary of "Radioactive Contamination in Fisheries Products."

An as yet unpublished report prepared by an ad hoc committee assembled by the International Atomic Energy Agency (1960) treated the subject of radioactive waste disposal into the sea.[7] This is the most comprehensive presentation of all phases of this subject yet developed. This report and the one on food and agriculture just noted are of unusual significance not only by virtue of their comprehensive nature but because they were developed by eminent international scientists and represent a consensus of scientific judgment from both the Eastern and Western Hemispheres.

In 1959, the Public Health Service conducted a seminar on biological problems in water pollution in conjunction with a symposium on the effects of discharge of radioactive materials on aquatic life. The transactions of this seminar, therefore, contain excellent information on biologic effects on marine life, including results of studies conducted in the western Pacific, in Canada, and on the Atlantic Coast.[8]

These eight reports, so briefly and superficially referred to here, should be regarded as an absolute minimum library of technological science to be understood and utilized by persons with responsibilities for associated activities in the field of public health. Each of the reports has one or more bibliographies of its own which can very effectively extend the search of any investigator for additional background material.

Why Should the Sea Be Used as a Receiver of Nuclear Materials?

It is inevitable that a small fraction of the radioactive wastes produced in the peaceful uses of nuclear energy, and of the radioisotopes employed for medical purposes, in research, and in materials testing in industry, will enter man's environment. It is not a matter now of deciding whether or not radionuclides, produced as a consequence of the peaceful uses of nuclear energy or utilized directly for the benefit of man for medical or research purposes, may enter man's

environment. This decision was made when it was decided to utilize nuclear energy and radioisotopes for peaceful purposes. The question which must be answered is the quantitative question of how much radioactivity may be introduced into the various segments of man's environment without incurring a measurable risk to man or to man's use of the products from such environments. It is not enough simply to require that the amount entering the environment be as small as possible. The designer of nuclear installations, the radiologist in the hospital, and the research worker in his laboratory must be given numbers on which to base their designs or operations.

The question of why the ocean should receive any radioactive materials deserves some consideration. The answer is twofold in character. First of all it is, in some cases, unavoidable that some of the products of man's use of nuclear energy will enter the marine environment. It is inevitable that some of the very low-level materials which are now allowed to enter the sewers, or which are now discharged to rivers, will ultimately reach the sea. Likewise some low-level effluent from reactors located on seacoasts, or used to propel ships, will without doubt enter the ocean.

Second, it is quite likely that the sea will be the safest place to dispose of certain radioactive waste materials, at least if we consider only those alternatives which are technically feasible, without imposing economic burdens not justified by the degree of risk involved.

The situation may be summarized as follows. In order for man to gain the benefits offered through the peaceful uses of nuclear energy and through the use of radioisotopes in medicine and in research, one must accept the fact that some artificially produced radionuclides will enter man's environment. The radiation dose to which the human population will be subject, over and above that imposed by the natural background, must be kept below levels which, on the basis of all available evidence, will not impose undue risk to man. Our basic responsibility is to utilize all of man's environment in a manner most consistent, both with the safety of the human population and the maximum beneficial use of nuclear energy. Inherent in the requirement of human safety is also the requirement that man should be able to use products from any segment of his environment and not be restricted in any way by factors deleterious to his health. The ocean then, as one segment of man's environment, will be utilized as a receiver of nuclear materials. The task of the public health authorities is to insure that such use of the sea, as well as of other segments of man's environment, does not endanger the health of man.

Present and Potential Sources of Radioactive Materials to the Sea

It is first of all necessary to recognize that there exist natural radioactive materials in the sea and that they have been there at least as long as man has been on the earth. The major contributor to this natural radioactive background in the sea is Potassium-40, which is present in concentrations of about 330 micromicro curies per liter. While the radiation dosage imposed on the biota of the sea by this natural background is considerably less than the natural radioactive dose rate experienced by terrestrial organisms, it far exceeds the radioactive dose rate imposed on marine organisms by artificially produced radioactivity which has entered the sea.

The second most important source of radioactive materials now in the sea originated with weapons testing and has entered the oceans both through direct fallout onto the sea surface and from flow-out in rivers draining into the sea. It is estimated that about 2 million curies of Strontium-90 have been deposited on the sea from general fallout, and an

additional 3 million curies have entered the Pacific Ocean as close-in fallout, as compared to about 1.8 million curies which have fallen on land. These amounts may be compared to the more than 100 million curies of radium activity naturally present in the sea. It is also important to note that at present terrestrial foods supply to the human diet the major sources of radioactive isotopes originating from fallout. Thus, marine food products contribute less than 1/1,000th of the total intake of radioisotopes by the average resident in the United States, and about 1/200th of the dietary intake of radioisotopes even for a sea food eating population such as that of Japan.

Unconfined liquid effluent from spent fuel processing plants and from plutonium plants contributes the third major source of radioactivity to the sea, and this is the most important source originating from peaceful uses of nuclear energy. The Windscale Works in England is now authorized to discharge, as a dilute low-level liquid effluent, about 100,000 curies of mixed beta activity per year into the Irish Sea; and on the order of 1,000 curies a day of induced beta activity enter the Pacific Ocean in the waters of the Columbia River as a result of operations of the AEC's Hanford establishment.[4]

By comparison, the remaining present sources of radioactive materials entering the sea are quite small and it is difficult to rank them in importance. Considerable public attention has been placed on the disposal of packaged waste materials into the sea. Between 1951 and July, 1959, approximately 10,500 curies of low-level packaged waste were disposed of in the Atlantic Ocean by various activities in the United States. This material was contained in some 25,000 55-gallon drums. Between 1946 and the middle of 1959, about 14,000 curies contained in slightly more than 21,000 drums and concrete boxes were disposed of in the Pacific Ocean off the West Coast of the United States. Much of this material had relatively short half-lifes, and without doubt only a small fraction of the total activity was released to the marine environment.[14]

In addition to packaged wastes, some large pieces of contaminated equipment have been disposed of in the sea. Thus the reactor structure of the Seawolf prototype was disposed of in the Atlantic Ocean about 230 miles southeast of Sandy Hook in early 1959. This steel structure contained about 33,000 curies of induced activity which, because it was incorporated as induced activity in the steel itself, would be released to the sea only as a result of corrosion of the metal. The rate of release of activity to the sea from this source is estimated at only 2 to 3 curies per year.[14]

The discharge of radioactive material to the sea from nuclear-powered ships, in the form of low-level liquid effluent and intermediate-level ion-exchange beds, at present constitutes a relatively small source of activity to the sea. With increased use of nuclear power for ships it is likely that this source will become more important, particularly since some of the radioisotopes involved are highly concentrated by some marine organisms.

Discharges from land-based reactors adjacent to the sea do not appear to constitute a major source of radioisotopes to the sea, either at present or for the future. Problems associated with such installations will be local in nature and can be minimized by suitable site selection and proper design of the effluent discharge system.

According to testimony before the Joint Committee on Atomic Energy, Congress of the United States, July, 1959,[14] it is current AEC policy to limit disposal of package wastes to depths greater than 1,000 fathoms. Recent surveys of several areas which have been used for packaged waste disposal have shown no activities in the water, sediment, or biota in ex-

cess of those associated with natural background and fallout.

It is extremely difficult to assess the potential contamination of the marine environment which might result from an accidental release of activity from a marine- or shore-based reactor, and no authoritative reports are available dealing with this subject.

Classification of Activity Levels of Waste

The general terms "high," "intermediate," and "low" level wastes are used to describe the degree of hazard associated with particular waste materials, though no fixed classification system has been agreed upon. Wastes are usually classified primarily as to source as follows.

"High"—Fission products confined in spent fuel elements and the residue of these products after separation from useful fuel material. None of this concentrated activity now enters the sea.

"Intermediate"—Large pieces of contaminated equipment or packages of spent ion-exchange resins (order of 10-10,000 curies of activity). Some of this material has been introduced into the sea.

"Low"—Laboratory trash, contaminated clothing, glassware, and small pieces of equipment (order of 1 curie or less per package); and dilute liquid waste in process of water from chemical treatment plants and primary coolant from marine reactors (having concentrations of the order of millicuries per gallon).

The biological significance of the particular isotopes involved enters into the ultimate classification. Thus several thousand curies of tritium might be considered a low-level waste, while a few millicuries of Strontium-90 or some other isotope of similar biological hazard might be classified as intermediate- or high-level wastes. The particular form of the wastes at time of disposal also plays an important role in designating the classification. Thus the liquid effluent from Windscale, which has a concentration of only a few millicuries per gallon, is called a low-level waste, even though the large volumes involved result in a total annual discharge of about 100,000 curies.

The Sea as a Site for Radioactive Waste Disposal

There are two general approaches to the treatment of radioactive waste materials. The first involves the principles of concentration and containment. In this case the wastes are reduced to the smallest possible volume and are confined in storage tanks or buried in vaults out of contact with man's environment. The second approach involves the principles of dilution and dispersion. Here the purpose is to so dilute the wastes in man's environment that the radioactivity which could return to man would be negligible compared to the natural background radiation to which he has always been exposed. The sea appears attractive as an environment for the application of both principles. One of the disadvantages of the principles of concentration and containment on land is that an accident to the containment structures could result in a concentrated waste being released in man's immediate environment. The sea has a large capacity for dilution and dispersal. Suitably designed containment packages placed into the deep water of the oceans would remove this activity from the immediate environment of man. Radioactivity accidentally released from such containment packages would be subjected to large dilution and dispersion before entering the surface layers of the sea which provide the bulk of the products man uses from the sea, and which is that part of the sea in most intimate contact with man. Certain types of waste, because of their low concentra-

tion of activity, are not suitable for treatment leading to concentration and containment. The sea appears as the safest environment for dilution and dispersion of such wastes.

The potential capacity of the sea to receive nuclear wastes is intimately related to the physical structure and circulation pattern of the world's oceans. The major part of the ocean volume (about 75 per cent) is filled with cold water, at a temperature between 1° C and 4° C, which originates in the high latitudes of the North Atlantic, South Atlantic, and possibly also in the Antarctic regions south of the Pacific Ocean. This large volume has a remarkably constant salinity of about 34.7 grams per kilogram. In the middle and low latitudes, a layer of relatively rapid density increase with depth and hence large stability, called the pycnocline or thermocline, separates this so-called "deep" water from the surface layers. The surface layer of the open sea is of variable thickness, from 10 to 200 meters thick, and is almost uniform in the vertical distribution of temperature and dissolved solids. Because of this uniformity the surface layer is frequently called the "stirred" layer or "mixed" layer. The surface layer constitutes about 2 per cent of the total volume of the world's oceans, and the intermediate layer of relatively large vertical stability comprises about 20 per cent of the total volume. Any contaminant introduced into the surface layers will be rapidly mixed vertically. This rapid vertical mixing results primarily from two processes:

a. Convection—which is produced when the density at the surface is sufficiently increased, either from a decrease in temperature or an increase in salinity, so that the surface water sinks and mixes with the subsurface layers.

b. Wind stirring—which produces turbulent mixing in the surface layers. The effect of such stirring decreases with depth and is dependent on the magnitude of the wind velocity. Stability, caused by increasing density with depth, decreases the effectiveness of wind stirring.

Any contaminant introduced into the surface layers of the deep sea will be transported away from the area of introduction by surface currents, which, in general, extend throughout the entire depth of the mixed layer. The major features of the important surface layer currents of the world's oceans have been studied for many years and are well known. The large-scale permanent currents, such as the Gulf Stream, the Kuroshio, and the Equatorial Current systems, transport vast quantities of water and actively disperse the waters of a major segment of the mixed layer throughout the area of each ocean basin in a relatively short time. Thus, the volume of water flowing through the straits of Florida in the Gulf Stream in a 15-year period is about equal to the volume of the upper 500 meters of the entire North Atlantic. It therefore appears likely that no area of the surface layers of the world's oceans can remain isolated from the rest of the surface waters for any length of time.

During transport by currents, any contaminant introduced into the surface layers will be dispersed horizontally by turbulent diffusion. Some evidence indicates that the intensity of such horizontal diffusion is fairly constant throughout the open ocean area. The rate of dispersion depends upon the magnitude of the coefficient of eddy diffusivity. This coefficient varies with the dimensions of the dispersing contaminated volume.

The result of this process of diffusion is the reduction with time of the maximum concentration of any contaminant introduced into the ocean, and a corresponding spread of the introduced material over a continually increasing area.

In deep water, movement and mixing are considerably less intense than in the surface layers. However, during the time taken for dispersal of the deep waters over a vertical distance of 1,000 meters or more, horizontal dispersion

will have occurred throughout much of each ocean basin. Thus, any contaminant introduced into the deep water of the ocean would be dispersed through a very large volume before spreading upward into the surface layers.

At high latitudes a convective motion extends to great depths and here exchange between surface layers and deep waters may be quite rapid. The exchange between the deep waters and the surface layers at mid- and low latitudes is restricted by the relatively stable intermediate layers. The deep water which sinks at high latitudes spreads throughout the deep ocean basins and slowly ascends through the pycnocline into the surface layers over the large ocean areas found at mid- and low latitudes. Present estimates of the rates of such upward motion range from 2 to 5 meters per year. In addition to this direct vertical flow some exchange takes place between the surface layers and the deep waters by mixing through the stable pycnocline.

It is estimated that the mean residence time of a particle introduced into the deep layers of the sea in mid-latitudes before returning to the surface layers is of the order of 400 years or more. During this period considerable radioactive decay would occur for even the so-called long half-life components of nuclear wastes.

In estuaries, inshore areas, and coastal waters both vertical and horizontal mixing are reduced, compared to the open sea, as a result of vertical stratification and boundary effects. These are the areas of the sea from which man harvests most of the products he obtains from the sea, and with which he is in most intimate contact. It is evident that estuarine and coastal waters have limited capacity compared to the open sea as a receiver of nuclear wastes.

For certain isotopes the chemical composition of sea water is an important factor in determining the safe capacity of the sea to receive nuclear wastes, since isotopic dilution may be as important as physical dilution in some cases. Thus the sea contains relatively large amounts of stable strontium, and for this reason Strontium-90 does not appear to be as much of a problem in the sea as in fresh water or on land. On the other hand, certain radionuclides whose stable isotope is in extremely low concentration in the sea are highly concentrated by marine organisms and, hence, are potentially of greater danger to man and his utilization of products from the sea.

Despite the various factors which favor dilution and dispersion in the sea, it is evident that there is a limit to the capacity of the sea to safely receive radioactive materials, since man should continue to have unrestricted opportunities for the harvest of marine products. Present knowledge of the sea is not sufficient to make precise estimates of this capacity, though order-of-magnitude estimates can be made and are useful in serving as guides in delineating the scope of the problem.

In particular, knowledge is sufficient to provide estimates which can with considerable assurance be taken to be on the safe side. This is borne out by post-use surveys of package disposal sites, as well as by the experiences at Windscale and Hanford.

Knowledge of the effects of substantial discharges of radioactive wastes upon the marine environment has been obtained from operations at the British Windscale Works discharging into the Irish Sea and at the Hanford, Wash., plant of the AEC discharging into the Columbia River. From preliminary investigation the British concluded that daily discharges of about 100 c/day of beta activity and about 1.1 c/day of alpha activity would be safe. Reassessment of safety factors based upon monitoring of shore, sea bed, and edible marine products over a period of years led to the new conclusion it would be possible

to discharge safely as much as 100,000 c/month. At Hanford, monitoring some 75 miles downstream of the reactors disclosed beta activity on the order of 2,000 c/day. Investigation of exposure of persons living in the vicinity of the plant and eating fish from the Columbia River indicates such exposure to be within permissible limits.[4]

The NAS-NRC Summary Report states: "The experiences at Hanford and Windscale illustrate that it may be possible to release radioactive materials to the marine environment with safety in significantly greater amounts than one could predict from preliminary information."

However, this report goes on to say: "Each environment presents a different set of conditions, however, and increase of releases at specific sites should be undertaken with caution and extensive monitoring. Because of the need for relatively precise data on the radiation exposures associated with waste discharge and for further knowledge of safe concentrations of various isotopes in the water, it is recommended that comprehensive monitoring programs be carried out at all future atomic energy installations that discharge substantial amounts of radioactive waste into marine or fresh water environments."[4]

Assimilation and Dispersal Mechanisms

Some of the general features of the physical processes of circulation and dispersal of radioactive wastes in the sea were briefly discussed in the previous section. In evaluating the capacity of a specific part of the marine environment to safely receive nuclear materials, consideration must be given to the fate of such material when introduced into that environment, which is dependent on the following considerations:

1. The physical and chemical form in which the material occurs at time of introduction, together with any relatively rapid changes in the physical and chemical character of the introduced material which occur when it is brought into contact with sea water. The subsequent dispersion by physical processes and reconcentration by the biota and bottom materials will be greatly affected by the physical and chemical form in which the wastes occur in sea water.

2. Initial mechanical dilution of the wastes by the receiving waters, which will depend upon the manner of introduction. Large initial mechanical dilution is important in reducing the density difference between the initial contaminated volume and the surrounding receiving waters. This reduction in turn favors subsequent turbulent diffusion.

3. Advection of the waste material away from the source region and simultaneous turbulent diffusion, which lead to reduced concentrations of the radioactive components in the water.

4. Uptake of the activity onto suspended silt and bottom sediments, which removes some of the radioactive materials from the water and restricts further dispersion. In deep water such removal would be favorable since material incorporated with the bottom sediments there would be unlikely to return to man's environment. In shallow coastal areas containing bottom feeding commercial fin fish, concentration of radioactivity on the bottom may be unfavorable since these detritus and filter feeders may further concentrate the activity from the bottom material.

5. Concentration of activity by various parts of the biota, including shellfish and fin fish important to man as a source of food. Some important fission products and corrosion products are concentrated by marine organisms by factors of from 100 to 10,000 over the concentrations of these isotopes in the water.

Examples of the approach used in evaluating these various factors for specific actual or potential cases of waste disposal are given in several references cited earlier. Further details of the physical and chemical processes will not be treated here. However, some comments should be made concerning the food chain in the sea, since it is through this cycle that radioactivity is most likely to be returned to man.

Effects Upon the Marine Food Chain Cycle

The complicated yet direct food relations in the marine ecological system

need not be reviewed in any detail. A concise yet inclusive summary of this system is presented in reference 7. Suffice to say that phytoplankton and seaweeds produce organic matter by using solar energy and taking nutrient salts from the water. As a result of this process they can concentrate radioactive elements at a high rate. Phytoplankton are consumed as food by zooplankton, by some filter feeding fishes, and by bottom dwelling benthic animals. The chain continues through cycles of higher and larger forms of marine life. Radioactive isotopes are passed along through the ongoing food chain although the amount of radioactivity generally decreases with successive stages in the chain. There is also evidence that, through isotopic exchange, activity may pass directly into the higher organisms from the sea water.

On the basis of present evidence, it would appear that if the radioactivity in the sea does not reach levels which would limit man's use of products from this environment, then there would be no danger to the marine biota from radiation damage. However, further documented evidence is required in this important area.[7,8]

The isotopes which appear to be of greatest consequence in regard to sea disposal of radioactive materials are the trace elements which are present in sea water in low concentrations, but which are utilized in metabolic processes or are readily adsorbed on organic materials. Such elements are highly concentrated by marine organisms, particularly the lower trophic levels. Radioactive isotopes in this group include Iron-55 and Iron-59, Cobalt-60, Chromium-51, Zinc-65, and Ruthenium-106.

Pre-Evaluation of the Safety of Any Specific Waste Disposal Operation

Knowledge of the physical processes of movement and dispersion, and the biological processes of reconcentration, is utilized in the pre-evaluation of the safety of a specific waste disposal operation. Since these factors will not be the same for all parts of the marine environment, specific knowledge is required for the particular situation under consideration. Oceanographic knowledge and technics are not at present sufficient to provide for precise determination of all the factors involved. However, adequate knowledge and technics are available to insure that the predicted allowable rate of introduction of radioactive materials to the sea will be on the safe side.

In any such evaluation the starting point is man and his utilization of the marine environment. Specialists other than public health personnel would normally be involved in such an evaluation. However, public health authorities should have sufficient familiarity with the general processes involved in the movement and dispersion of wastes in the marine environment, with the reconcentration of radioisotopes in the marine biota, and the possible routes of such radioactive materials in returning to man, so that they can be assured, through critical evaluation of the studies made by others, that all possible factors have been given adequate consideration.

Contemporary Investigations

The need for additional new knowledge regarding the manner in which the marine environment reacts to and is affected by the introduction of radioactive material becomes increasingly urgent. Despite the fact that considerable further research is necessary on many pertinent environmental factors affecting waste disposal, the Atomic Energy Commission faces immediate waste disposal problems which require the application of existing oceanographic knowledge. The National Academy of Sciences, under two of its existing committees (the Committee on Oceanography and the Committee on Effects of

Atomic Radiation on Oceanography and Fisheries), has established three working panels of marine scientists, each of which is preparing recommendations on specific problems of concern to AEC.

A number of very significant studies in the category of biological uptake and retention by various forms of marine life are under way, shortly to be started or have just recently been completed. In brief, these are as follows.[12]

The important studies of Chipman, U. S. Fish and Wildlife Service, seeking to determine the effects of radioactive materials upon fin fish have been in progress for several years at the Beaufort, N. C., laboratories and will continue.

The investigations at the Chesapeake Bay Institute, the Johns Hopkins University, involve studies of the physical processes of movement and dispersion of waste materials in coastal and estuarine environments, as well as studies of the geochemical processes of adsorption on sediment and the biological processes of uptake of activity by marine plankton.

A research project of major significance is shortly to be initiated by the Public Health Service and the U. S. Fish and Wildlife Service in the Savannah River area. This study will seek to define the changes, if any, in shellfish, fin fish, seaweed, and algae in the river downstream from the Savannah River Works of the Dupont Company. Another river in the same region but not within the Savannah basin will be used as a control.

In Cincinnati, Ohio, the Public Health Service is now starting a research project within a fish hatchery to study the effects of radioactivity upon fresh water fish.

At the University of Hawaii, the Marine Biological Research Station has been exploring for several years the effects of radioactivity upon fin fish.

It may be noted, therefore, that investigations of possible effects upon fin fish are under way in both the Atlantic and Pacific Ocean areas and in the fresh water environment.

Within recent months the investigations of Shipman, Gong, and Weissman, of the U. S. Naval Radiological Defense Laboratory, have been completed on the uptake and retention of Co^{60} by the giant clam.

A tremendous amount of data concerned with marine biology and radioactivity effects upon biological life in the South Pacific area was accumulated during the nuclear bomb testing operations at Bikini and Eniwetok. Subsequent follow-up investigation in these same areas, termed Operation Troll, has produced much valuable information concerning the manner and the rate of the return to normal of the marine environment after being subjected to radiological insult. These data are being studied and reported upon by several groups. A presentation made by Donaldson of the University of Washington at the 1959 Public Health Service seminar[8] was based upon this work.

Oceanographic authorities have continued to emphasize the need[2-4,10,11] for investigation of those phenomena of the marine environment which govern the assimilation and dispersal of radioactive substances not only in the ocean deeps but in bays, estuaries, coastal waters, and restricted waterways. The process of turbulent mixing is one of the least understood physical phenomena in the field of oceanography. Further understanding is needed of the geochemical factors relating to the physical and chemical state of the various components of radioactive wastes when mixed with sea water and the processes of uptake of these components by suspended silt and bottom sediment.

At present, a specific evaluation of New York harbor is in progress with regard to the dispersion and movement of radioactive materials which might be introduced there. This project is being sponsored by the AEC and the Maritime

Administration. Field work is being performed by the U. S. Coast and Geodetic Survey, with data analysis the responsibility of the Chesapeake Bay Institute, the Johns Hopkins University.

Other research activity involves the classification of harbors and coastal waters according to the major factors influencing the movement and dispersion of contaminants which might be introduced into them. The purpose of this study is to provide a basis for extrapolating the results of detailed investigations, such as the one being conducted in New York harbor, to harbors and coastal areas for which only limited data are available. Exchange and flushing rate studies are in progress also in Baltimore harbor, Delaware Bay, and Narragansett Bay.

In order to establish radiological background levels in harbors which will be used by nuclear-powered ships, monitoring and surveillance type investigations have been initiated in major ports on both the Atlantic and Pacific Coasts. These locations include Portsmouth, N. H.; Boston, Mass.; Groton, Conn.; Delaware Bay; Hampton Roads, Va.; Charleston, S. C.; and San Francisco, Calif. These studies are only in their initial stage. It is probable that similar work in other important ports will be instituted in the early future.

This résumé gives, perhaps, only a small understanding of the nature, diversity, and scope of the research currently in progress which seeks a fuller comprehension of problems associated with radioactivity finding its way into the marine environment. Public health authorities should maintain a keen interest in such work and support it in every way possible.

Public Health Significance and Responsibility

As noted in the opening paragraphs of this report, the primary objective was to present the challenge of radioactivity in the marine environment in the perspective desirable for those concerned with preventing and controlling hazards to the public health. Perhaps, with the ever increasing interest on the part of practitioners of science in all things radiological, it is unnecessary to be in any way concerned that the radiological health aspects of marine food sanitation be adequately dealt with by those concerned with public health programs. It would be remiss, however, to make such an assumption.

It is known, for example, that marine food sanitation is regarded as a geographic problem—one confined to, and happily consigned to, the health and fisheries authorities of the producing states and the federal government. A continuing obstacle to the marketing surveillance activities of the cooperative interstate shellfish certification program has been the apathy of inland health authorities regarding their obligation for adequate checking of these marine food products on the receiving end. With the notable exception of controls exercised by local health authorities in several cities constituting major markets for marine food products, public health authorities in the receiving areas have generally relied upon the control exercised by the producing states and the monitoring activities of the Public Health Service. Basic production of marine food products must of necessity be geographically confined and will continue to be. With the high degree of advancement in food processing technology—preparation, packaging, and freezing, with remarkably rapid facilities for transport to even distant inland or cross-country markets—problems of marine food sanitation, whether they involve cleanliness, adulteration, bacterial disease prevention, or radiological hazard prevention, have become nation wide in scope.

By the same token, in any future concern for the wholesomeness and health-

fulness of marine food products from a radiological standpoint, public health authorities cannot afford to rely exclusively upon the surveillance and control activities of their colleagues in oceanography and marine biology. The establishment by public health authorities of systematic monitoring activities for marine foods, within the framework of the surveillance network they will operate for other food and factors within the environment, should be thoughfully planned.

One of the cited reports pointed out that all disposals of radioactive wastes from nuclear-powered ships in harbors and national waters should be in conformity with conditions laid down by local authority.[7] This apparently implies a corollary recommendation that local authority should concern itself with the establishment of proper and realistic conditions under which such disposal can take place. Such conditions and associated controls will be of inestimable value in major sea food producing areas as, for example, the Chesapeake Bay. Public health authorities must share the responsibility in such determination.

The responsibility just noted seems also to require, in so far as may be needed, a coordinated effort by government and industry to develop operating policies and controls which will insure that the nation's marine food resources will be protected against possible contamination with radioactive wastes. Research now under way should be continued to define the relationships between specific radionuclides and marine fisheries.

Exercising public health controls in the marine food field in relation to radiological hazards will require a clear understanding of numerous factors each, perhaps, relatively influencing the others. Some of these may be stated as:

Determination of the partial permissible concentration of the specific radionuclide(s) in the food involved.

Assessment of the dietary importance of a marine food in relation to milk and terrestrial grown food in the diet of the population in question and, also, in relation to the weight of each food factor as a source of total body radiation.

In the IAEA report previously referred to,[7] it was noted that the control authority must have a definite understanding of how various marine products are utilized, such as sea food (including fish), shellfish, seaweeds, and salt, where:

Sea food may be harvested locally and eaten locally;

It may be harvested and transported to remote areas and then eaten;

The sea food may have moved some distance from a point of possible contamination before being harvested.

Along with this there should be an appreciation of other uses of marine products, such as production and use of alginate from seaweed and use of sea products as fertilizer.[7]

It has been previously noted that various forms of marine biological life have the capacity to take up and concentrate various nutritive minerals (including radioactive ones) present in sea water. This has been shown to be characteristic of certain seaweeds. It has been demonstrated with regard to the viscera, bones, and muscle of fin fish. As future surveillance and monitoring programs are established for items derived from the marine environment, it would be advantageous to ascertain whether there is any possible carry-over of radioactivity into medicinal or nutritional supplements. Examples of such products are vitamin-rich oils obtained from cod and shark livers and the mineral supplements obtained from the giant kelp.

A major role of health authorities has always been to assure that the public is provided with factual and, in so far as possible, reassuring information concerning effects of various organisms, compounds, environmental conditions, and so forth upon health. It has been a re-

sponsibility of such authorities to develop or to promote the development of adequate controls for the various environmental hazards which have presented themselves within recent history, so that they could give reassuring information to the public as needed on these matters.

In regard to the public health aspects of radioactivity in the marine environment, particularly in relation to marine food products, public health authorities will continue to bear the same responsibility. Surveillance and monitoring of the food producing environment as well as of the food itself is indicated. Measures for exercising controls must be understood and applied. 'Warning as to hazard is an obligation when hazard exists and on occasion must be utilized. Public health philosophy requires, however, that provision be made for adequate control so as to prevent hazard, thereby making possible the extension of positive assurance that public health and welfare have been properly protected. It behooves health authorities, therefore, to establish and maintain themselves in the position from which they can operate in the positive sense here noted.

As a result of the information it has recently acquired, the general public is keenly interested in problems of radioactive waste which give indication of affecting food, water, or various economic interests. The release of NAS-NRC Publication No. 655[2] concerned with planning for disposal of packaged low-level wastes on the eastern continental shelf of the United States resulted in the holding of a special congressional hearing.[14] Plans announced by the French Atomic Energy Commission for disposal of similar packaged wastes into the Mediterranean Sea between Corsica and Antibes have drawn expressions of alarm from Monaco, cities of the French Riviera, and the Mediterranean islands.[15] President de Gaulle was reported as planning personal conferences on the protests. A report in a Richmond, Va., newspaper in January, 1960, noting that small amounts of Z^{65} had been detected in Chesapeake Bay oysters and Atlantic seaboard clams[16] resulted in buyer resistance in the Virginia oyster market for several weeks.

Although it is not suggested that public health authorities had any sort of responsibility in preventing such occurrences, these are offered as examples of public reactions which can and do occur. Where reaction of the public is prompted by concern for health, health authorities should be prepared to anticipate the extent to which it may occur and provide positive reassurance to counter needless emotional outburst and economic injury. An interesting example of the way in which such information can be made available is contained in a news service release. In a Fish and Wildlife Service Report (July, 1960) concerning possible effects on fish and shellfish from the operation of a proposed nuclear reactor to be located on the West Coast, the conclusion was reached:

> "In view of our present knowledge, the discharge of radioactive wastes into Humboldt Bay in the volumes and levels of radioactivity estimated in the request would not result in concentrations of radioactivity that would make the marketing of oysters and clams hazardous.
>
> "Nevertheless the applicant should be advised that any accumulation of radionuclides by shellfish is likely to cause adverse publicity and loss of market."[17]

The second part of this quote would seem to anticipate the same type of public reaction as that previously noted as occurring following the January, 1960, news report in Virginia.

It has not been possible to include within this report precise data on kinds, amounts, and activity levels of radionuclides in various types of sea food. This has been intended as a general survey of the subject, the extent to which knowledge concerning it is available,

areas in which research is now under way, and objectives which should be of concern to public health authorities. As data concerning specific levels of radionuclides in various forms of marine biological life might be desired, inquirers should refer to the literature reporting investigations associated with the British Windscale Works, the AEC's Hanford Works, and the Western Pacific nuclear bomb testing operations.

The note of greatest optimism it is possible to strike in this presentation is to report that in reviewing the literature and related administrative activities to date, the available scientific data and reports are definitely reassuring. Disposal of nuclear materials into the marine environment and development of adequate safeguards for the operations are both evaluated with objective scientific appraisal. The approach is based on the assumption of normal operating and waste disposal activities. While such an assumption does not contemplate major accidents or disasters, necessary measures for quickly determining the degree and extent of the effects of accidents are being taken into consideration. The need for prompt control procedures to be instituted in any emergency is well recognized.

It would be appropriate to conclude this section on public health significance and responsibility with several thoughts presented by Professor Abel Wolman in a lecture entitled "Radiation and the Health Officer."[13] In pointing out the responsibility of health authorities for administrative decision and control in the radiological health field, he said:

"Such administrative decisions will become complex and burdensome. That they cannot be avoided is almost axiomatic. That they will be met through current administration practices is a reasonable prospect."

And also, "Health Departments are rapidly extending their responsibility in these areas. They do so because radiation hazards are real, exposure is increasing and adds to body stresses, and because it can be controlled and reduced without losing the increasing benefits and values of such application. . . ."

Conclusions

1. From a public health standpoint, marine food problems consequent to disposal of radioactive wastes in the marine environment are not geographically limited in point of public impact. Inland health authorities share substantially in responsibility for sea food surveillance activities.

2. Excellent basic information is available to public health officials upon which surveillance and control programs may be developed. A comprehensive knowledge of how radiological, biological, and oceanographic factors exert their influences will contribute materially to the application of effective concepts of hazard prevention.

3. Public health authorities, utilizing and collaborating with colleagues in allied fields of science—notably oceanography and marine biology—can meet the challenge of protecting the public from any radiological hazards which might be associated with foods originating in the marine or fresh water environment.

4. For effective surveillance and control of any radiological problems associated with sea food, there must be a clear understanding of the nature and source of the radionuclide, the manner in which the radionuclide is metabolized or concentrated by the biological organism, the significance of the food in the diet of the population, and the partial permissible concentration of radioactivity it constitutes for man in his normal geographic habitat. Also required would be an assessment of the relative quantities of radioactivity in food from both terrestrial and marine sources before making a final determination of the degree of hazard associated with either.

5. Public health authorities have an

historic and continuing responsibility to the public to appraise, control, and advise concerning hazards to the public health. In areas of unusual public concern—i.e., radiological hazards to health and well-being—health officials have the obligation of providing the public with correct information, aiding in its proper interpretation, and providing positive assurance of protection by familiarizing the public with the nature and extent of the controls being exercised.

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The approach to the problem of air pollution taken by California is presented here. While many of the California activities are similar to those of other states, a number of significantly different aspects do exist. They are discussed, especially the emission of pollutants by motor vehicles.

A STATE APPROACH TO AIR POLLUTION

John A. Maga

PROGRAMS dealing with air pollution are found at the federal, state and local levels of government. The approach at each of these levels has followed legislative assignment of responsibilities and the recognition that some activities can be carried out more effectively at one of the levels rather than at others.

One area of responsibility that has been rather well defined is enforcement or the control of air pollution sources. It has been generally agreed that these activities should be undertaken at the local level of government. This, of course, assumes that the local area is large enough to support a sound program and employ the necessary personnel. Strong local programs usually are found in large communities or in metropolitan regions. The responsibilities of the federal government in air pollution have also been well defined and include research, training, and technical assistance.

State approaches to air pollution have probably shown the greatest variation of all levels of government. They reflect the patterns of local government, existence or absence of large metropolitan regions and the nature of the problem and needs in each state. Some programs stress control, while others are mainly concerned with investigations and assistance. It is to be expected that state air pollution programs will differ in accordance with the needs and problems in each instance. In actual practice the differences are probably not so much in the basic elements but, rather, in the extent of the activities that are undertaken. For the purpose of this discussion the principal responsibilities of state programs have been separated into five categories, as follows:

Assistance to Local Agencies

Assistance to local agencies is included in all state air pollution programs. It usually will include advice on existing control programs and where control activities should be undertaken, fostering development of effective local programs, providing laboratory support, and rendering technical assistance on specific air pollution problems. This assistance will be of greatest benefit to the smaller local agencies with limited staff.

Investigation and Surveillance

State programs include studies of the nature and cause of air pollution throughout the state, the effects of air pollution, and special air pollution problems. Investigation and surveillance will require

air measurements. In areas with severe air pollution problems the state may find it necessary to maintain a surveillance of the effects of air pollution and of populations exposed to air pollution. Where unusual problems exist the state may have to undertake or support research on air pollution and its effects.

Standards and Guides

An important function of state programs is providing standards and guides for control activities. This is an area that has often received little attention. The state should consider the need for establishing standards for activities such as air monitoring and laboratory methods, for air quality and for control purposes.

Coordination

Since a number of agencies at all levels of government are concerned with air pollution and are active in some phases of the problem, coordination of activities is important. The state is a logical level of government to provide needed coordination for air pollution programs. Some of the more effective ways this can be accomplished include the evaluation and interpretation of the state-wide problems, establishment of guides and standards, arranging conferences on problems of common interest, and collecting and disseminating data and information on air pollution.

Control

As has already been mentioned, enforcement of air pollution control is basically the responsibility of local agencies. The state will be concerned with control of air pollution even though it may not be the enforcing agency. In some instances, however, it may not be feasible to achieve effective controls at the local level and the state must assume some responsibility in this field. The local agencies may not be large enough to support an adequate control program; the air pollution problem may involve a number of separate local jurisdictions or the nature of the source and the enforcement required is such that only state control is practicable.

State Approach to Air Pollution in California

The State Problem

The approach to air pollution in California has been strongly influenced by the fact that a new kind of problem was experienced. As a result, California was required to undertake a considerable amount of research and investigation. It has also been forced to embark on new approaches to seek a solution to its problem.

Air pollution which has caused so much difficulty in Los Angeles and other California cities is not the type experienced in most other cities throughout the country. Rather it is produced by a reaction, in the presence of sunlight, between organic compounds and oxides of nitrogen. The products of this reaction are responsible for the air pollution episodes and include substances that cause eye, nose, and throat irritation to large numbers of people, reduce visibility, and damage vegetation.

The need to solve this problem is apparent when one considers the present levels and extent of air pollution in California, together with the growth that is expected. Counties in the state in which community-wide air pollution has been experienced contain almost 80 per cent of California's 15 million citizens. These counties, as well as most of the others, are growing at a rapid rate and the state's population is expected to double within the next 25 years. It is obvious that areas where air pollution now exists will have more frequent and severe attacks unless effective controls are

undertaken. Other communities not yet experiencing air pollution will be faced with this problem as they become more densely populated.

In Los Angeles, pollutants from stationary sources are being strictly controlled by the control district in that county. Open dump burning and backyard incinerators were eliminated. Refuse can only be burned in properly designed incinerators that meet rigid performance standards. As a result, most of this material is now disposed of in sanitary landfills. Emissions of smoke, dusts, fumes, and vapors from industrial operations were curtailed by installation of highly efficient control devices. Hydrocarbon losses from petroleum refining, storage, and distribution have been sharply reduced. Regulations have been adopted on the sulfur content of fuels that can be burned and on the olefin content of gasoline. Although the control of fixed sources in Los Angeles has reduced the quantity of pollutants discharged to the atmosphere and prevented the development of more serious air pollution, it has not solved the problem.

Regulations not as extensive but quite similar to those in Los Angeles have been adopted by several other counties. In the San Francisco Bay Area open burning has been banned and strict and comprehensive regulations were recently enacted by the control district on emissions from combustion sources, industry, and incineration.

It is clear that control of stationary sources of air pollutants alone will not solve the California problem and that emissions from motor vehicles must also be included in the attack on air pollution. Motor vehicles emit large quantities of hydrocarbons, oxides of nitrogen, and carbon monoxide. Emission data indicate that motor vehicles are responsible for a high percentage of the total quantity of these compounds discharged into the atmosphere of Los Angeles. Hydrocarbons and oxides of nitrogen are both involved in the photochemical reaction that takes place in the atmosphere. Carbon monoxide is of concern because of its toxic properties.

Motor vehicles present a unique control problem. They are present in very large numbers. They are a common source of air pollutants in the various regions of the state. They are sources which move freely across political boundaries. And they are subject to registration and licensing by the state. Because of these reasons, it was concluded that local agencies in California could not establish and enforce an effective control program for this source and that control would have to be at the state level.

Legislation

California has enacted considerable legislation on air pollution since 1947. As a consequence, the responsibilities of both the state and local levels of government have been clearly defined.

The Legislature has provided that local air pollution control districts have the basic responsibility for the control of emissions to the atmosphere. These districts have been established as county-wide or multiple county units in the densely populated areas. They have broad powers to adopt and enforce rules and regulations directed at controlling air pollutants. They also carry out other related activities necessary to the control programs.

The Legislature has designated the role of the State Department of Public Health to be one of fact-finding, investigation, and research, interpretation, technical assistance, and standards-setting. It has also designated responsibility for research to the University of California by appropriating funds for this purpose.

Recently the Legislature established a Motor Vehicle Pollution Control Board. It is located in the State Department of

Public Health but is responsible only to the governor. The board has the responsibility for the control of emissions from motor vehicles by approving and certifying control devices. The authority for controlling other sources of air pollutants remains that of local agencies.

State Program

The air pollution program at the state level in California includes a number of activities similar to those in other states such as air monitoring, assistance to local agencies, investigations, and coordination. Because of the nature of the problem, however, emphasis has been placed on several areas not normally stressed in other states. Rather than describing all the activities in California, only those that are somewhat different from most state programs will be discussed.

Although research in air pollution is considered mainly to be a responsibility for the federal level, California has had to emphasize this activity in an attempt to find answers to the many questions that exist and to learn if California's air pollution affects human health. State financed research is carried on by both the University of California and the State Department of Public Health. A large part of the department's air sanitation budget is used to support contract research dealing with the effects on health. In addition, investigations on health effects, identification of pollutants, and other aspects of air pollution have been conducted by the department's own staff and through funds provided by the state as well as contracts and grants from other agencies.

Since 1954 the department has conducted some 60 studies on the health effects of air pollution. These studies have dealt with mortality and morbidity in populations exposed to air pollution, the effect of air pollution on groups of people considered to be the most sensitive to it, and projects to delineate the more subtle and long-range effects of air pollution. Contract research supported by the department has covered a variety of problems, including the development of methods for carrying out health studies on human subjects during air pollution attacks.

The growth of air pollution in California, establishment of control districts in a number of counties, and recognition of the importance of motor vehicle emissions indicated that new approaches to the control problem were needed. It was with this background that the Legislature, in 1959, enacted bills requiring the State Department of Public Health to establish standards on air quality and standards for motor vehicle exhaust emissions. The bill on air quality standards required that "The standards shall be so developed as to reflect the relationship between the intensity and composition of air pollution and the health, illness, including irritation to the senses, and death of human beings, as well as damage to vegetation and interference with visibility." A second bill stated that the director of public health was to determine "the maximum allowable standards of emissions of exhaust contaminants from motor vehicles which are compatible with the preservation of the public health, including the prevention of irritation to the senses."

The purpose of the air quality standards was to provide a basis for evaluating air pollution levels in California and to establish guides for air pollution control efforts. Motor vehicle exhaust standards were to define the maximum emission from this source and the degree of control that will be required. It is apparent that the exhaust standards must be related to those for air quality. The first step was to establish the air quality standards.[1] It was then necessary to determine the reduction in motor vehicle exhaust emissions required to achieve the air quality defined by these standards.[2]

Table 1—Standards for Ambient Air Quality—California State Department of Public Health, December, 1959

	"Adverse" Level Level at which there will be sensory irritation, damage to vegetation, reduction in visibility or similar effects.	"Serious" Level Level at which there will be alteration of bodily function or which is likely to lead to chronic disease.	"Emergency" Level Level at which it is likely that acute sickness or death in sensitive groups of persons will occur.
Oxidant	"Oxidant index" 0.15 ppm for one hour by the potassium iodide method (eye irritation, plant damage, and visibility reduction)	Not applicable	Not applicable
Ozone		Footnote 1	Footnote 2
Nitrogen dioxide		Footnote 3	Footnote 3
Hydrocarbons		Footnote 4	Footnote 4
Photochemical aerosols		Not applicable	Not applicable
Carcinogens	Not applicable	Footnote 5	Not applicable
Sulfur dioxide	1 ppm for 1 hour or 0.3 ppm for 8 hours (plant damage)	5 ppm for 1 hour (bronchoconstriction in human subjects)	10 ppm for 1 hour (severe distress in human subjects)
Sulfuric acid	Footnote 6	Footnote 6	Footnote 7
Carbon monoxide	Not applicable	30 ppm for 8 hours or 120 ppm for 1 hour (interference with oxygen transport by blood)	Footnote 8
Lead	Not applicable	Footnote 9	Footnote 9
Ethylene	Footnote 10	Not applicable	Not applicable
Particulates	Sufficient to reduce visibility to less than 3 miles when relative humidity is less than 70 per cent	Not applicable	Not applicable

Footnotes to Standards

1. Ozone, at 1 ppm for eight hours daily for about a year, has produced bronchiolitis and fibrositis in rodents (Stokinger, H. E.; Wagner, W. D.; and Dobrogorski, O. J. A.M.A. Arch. Indust. H. 16:514, 1957). Extrapolation of these data to man is difficult. Functional impairment data have been reported by Clamann and Bancroft (Clamann, H. G., and Bancroft, R. W. Advances in Chemistry. No. 21, pp. 352-359, 1959); at 1.25 ppm some effect is observed on residual volume and diffusing capacity. The variability of the tests was not reported. Additional data would be needed before a standard is set.
2. A value of 2.0 ppm of ozone for one hour may produce serious interference with function in healthy persons, and the assumption is made that this might cause acute illness in sensitive persons. (Clamann, H. G., op. cit.)
3. Five ppm of nitrogen dioxide for eight hours will produce decreased pulmonary function in animals. High levels (150-200 ppm) in short exposures produce fibrotic changes in the lungs of man that may end fatally. More data on human exposures will be needed prior to setting a standard.
4. Hydrocarbons are a group of substances most of which, normally, are toxic only at concentrations in the order of several

The legislative acts and the standards adopted by the California State Board of Public Health provide a new approach to air pollution control. Establishment of air quality standards as guides to control efforts is a departure from the usual air pollution program. The adoption of limits of emissions of pollutants from motor vehicles is also a new step in air pollution control.

Table 1 shows the air quality standards adopted by the department. Three levels were established; these are defined under each of the levels in the table. The basis on which each concentration was selected is also included in the table. The three levels are not merely different degrees of severity but represent qualitatively different effects.

A rather limited number of compounds were included in these first standards. Additional substances will be added as more information becomes available. Footnotes were included with the standards to cover compounds of importance to air pollution in California but on which it was felt there were insufficient data to permit standards at this time.

The standards adopted for motor vehicle exhaust emissions are shown in Table 2. These were determined in light of the existing understanding on the photochemical reaction that takes place, the air quality standards, air pollution levels in Los Angeles and data on emissions of hydrocarbons and carbon monoxide from all sources in Los Angeles. As indicated in the footnote to Table 2, the standards require a reduction of 80

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hundred parts per million. However, a number of hydrocarbons can react photochemically at very low concentrations to produce irritating and toxic substances. Because of the large number of hydrocarbons involved, the complexity of the photochemical reactions, and the reactivity of other compounds such as nitrogen dioxide and ozone, it is not yet possible to establish "serious" and "emergency" levels for hydrocarbons. From the public health standpoint, the concentration of those hydrocarbons which react photochemically should be maintained at or below the level associated with the oxidant index defined in the "adverse" standard.

5. Carcinogens include a few organic compounds such as some polycyclic hydrocarbons, and some metals such as arsenic and chromium. Studies on effects on such substances are currently under way, but there are not sufficient data, at present, to set standards. In the meantime, it is recommended that concentrations of carcinogens in air should be kept as low as possible.
6. A sulfuric acid mist level of 1 mg/M^3 with an average particle size of one micron will produce a respiratory response in man. (Amdur, M. O.; Silverman, L.; and Drinker, P. Arch. Indust. Hyg. & Occup. Med. 6:305, 1952.) It is not possible to generalize from this for all air pollution conditions, because under natural conditions particle size will vary. Only with large droplets would sensory irritation be produced without other physiological effects.
7. A level of 5 mg/M^3 of sulfuric acid mist for a few minutes produces coughing and irritation in normal individuals (Amdur, M. O.; Silverman, L.; and Drinker, P., op. cit.). Presumably, it could cause acute illness in sensitive groups of persons in a period of one hour.
8. Given certain assumptions concerning ventilatory rates, acute sickness might result from a carbon monoxide level of 240 ppm for one hour in sensitive groups because of inactivation of 10 per cent of the body's hemoglobin. In any event it is clear that when a population exposure limit has been set for carbon monoxide, because of exposures from other sources, community air pollution standards should be based on some fraction of this limit.
9. It is clear that lead levels should be set on the basis of average values for long periods. While data are abundant concerning human response to eight-hours-a-day, five-days-a-week exposures, data are insufficient for the effects of the continuous exposure inherent in community air pollution. While laboratory studies will be pursued with vigor, it becomes very important that local agencies collect data on existing lead levels. Since lead exposures are from multiple sources, community air pollution standards should be based on a portion of the total limit for population exposure.
10. Ethylene causes severe damage to vegetation. Ornamental plants are severely injured by exposures from 0.2 to 0.5 ppm. Tomatoes and fruit are adversely affected at similar levels. Current work is expected to permit a standard to be set within a year.

Table 2—Standards for Motor Vehicle Exhaust Emissions

The standards of emissions of motor vehicle exhaust contaminants are:

Hydrocarbons —275 ppm by volume as hexane.
(0.165 mole per cent carbon atoms.)

Carbon Monoxide—1.5 per cent by volume.

The standards refer to a composite sample representing the driving cycle described below. Exhaust gas concentrations shall be adjusted to a dry exhaust volume containing 15 per cent by volume of carbon dioxide plus carbon monoxide.

Hydrocarbons are defined as the organic constituents of vehicle exhausts as measured by a hexane-sensitized nondispersive infrared analyzer or by an equivalent method.

Carbon monoxide shall be measured by a nondispersive infrared analyzer or by an equivalent method.

Driving Cycle

Condition	Rate of Speed Change Mph/Sec	Per cent of Total Time	Per cent of Total Sample Volume
Idle	—	15.0	4.2
Cruise			
20 mph	—	6.9	5.0
30 mph	—	5.7	6.1
40 mph	—	2.7	4.2
50 mph	—	0.7	1.5
Acceleration			
0-60 mph	3.0	1.1	5.9
0-25 mph	2.2	10.6	18.5
15-30 mph	1.2	25.0	45.5
Deceleration			
50-20 mph	1.2	10.2	2.9
30-15 mph	1.4	11.8	3.3
30- 0 mph	2.5	10.3	2.9
		100.0	100.0

Footnote

1. It has been judged that an over-all 80 per cent reduction of motor vehicle exhaust hydrocarbon emissions is needed. The hydrocarbon concentration expressed in these standards was derived by applying this per cent reduction to the current estimated average exhaust hydrocarbon concentration.

   It has been judged that an over-all 60 per cent reduction of motor vehicle exhaust carbon monoxide emissions is needed. The carbon monoxide concentration expressed in these standards was derived by applying this per cent reduction to the current estimated average exhaust carbon monoxide concentration.

   In the application of the standards to the approval of exhaust control systems, consideration must be given to such factors as warm-up time, reliability, and effective life of control devices, and exemption of certain groups of vehicles from compliance. If a substantial number of vehicles are allowed to greatly exceed the standards the objective of the standards may not be reached.

per cent in hydrocarbons and 60 per cent in carbon monoxide.

Obviously the standards for air quality and for motor vehicle exhausts cannot be considered complete and in final form. Additional data are required to place the present air quality standards on the firmest possible scientific basis and to set standards on other compounds of importance to California. Information is needed on the long-term effects of air pollution and on the effects

of the combination of pollutants if air quality standards are to be more closely related to exposure occurring in air pollution.

Motor vehicle emission standards for other pollutants such as oxides of nitrogen and for hydrocarbon losses from the crankcase vent, carburetor, and fuel tank may also be desirable. Improved methods for measuring exhaust hydrocarbon and oxides of nitrogen, additional data on emissions from motor vehicles, and a better understanding of photochemical air pollution are required to refine and improve the present motor vehicle standards. The lack of adequate data on many items of concern in both the standards for air quality and motor vehicle emissions illustrates the great need for more research in air pollution.

Following adoption of the standards for air quality and motor vehicle exhaust emissions by the department, the Legislature in 1960 enacted a bill to bring about the control of emissions from motor vehicles. This bill established a Motor Vehicle Pollution Control Board which has the responsibility to approve and certify emission control devices for installation on motor vehicles. In approving these devices, the board must find that they meet the motor vehicle emissions standards established by the State Department of Public Health. In addition, the board can adopt other criteria for devices, such as costs, life, ease of inspection, or any factors it considers important. Once two or more devices have been certified by the board, a time schedule for installation of devices on motor vehicles goes into effect. This schedule varies from one year after certification for all new motor vehicles, to two years for all commercial vehicles and three years for all motor vehicles.

Although devices will be required on all new vehicles registered in California, the law provides that the board of supervisors in each county or the governing body of the local air pollution control district, where appropriate, can determine if the law should apply to used vehicles. This provision recognized that not all counties in the state have air pollution problems of the same severity.

Conclusion

The state approach to air pollution in California is similar to that of other states in a number of respects. Somewhat different steps have been required to cope with California's problem and to control emissions from motor vehicles. These activities include research, standards for air quality and for motor vehicle emissions and a state program to require air pollution control devices on motor vehicles. While not all the problems have been solved and all the questions answered, an orderly procedure for dealing with the air pollution problem has been developed.

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Data from experiments in artificially and naturally polluted sea water indicate that ultraviolet radiation effectively destroys coliform organisms. The unit developed for this purpose is described and the results obtained are analyzed.

DISINFECTION OF SEA WATER BY ULTRAVIOLET RADIATION

C. B. Kelly, F.A.P.H.A.

THE use of ultraviolet radiation for the disinfection of water has been investigated primarily for its applicability to fresh waters, although in recent years investigations with sea water have been conducted in Japan and in England, particularly in connection with water to be used for the purification of shellfish. Studies on fresh water have been directed primarily toward the sterilization of drinking water and swimming pools, but the method has also been evaluated for the disinfection of small containers used for dispensaries and surgeries and for biochemical products when heat treatment would have an adverse effect.

Our interest in the ultraviolet treatment of sea water arose from the need for a continuously flowing supply, having a uniformly low bacterial content, for study of the accumulation and elimination of enteric bacteria in oysters.

Luckiesh and Holladay,[1] present fundamental data on the radiation requirements for disinfection of fresh waters of specified physical and chemical characteristics. The factors which influence the quantity of radiation required were found to be those which affect the penetration of ultraviolet energy through the water. Turbidity, color, and dissolved iron salts were found to be among the naturally occurring qualities which had the greatest effect on the absorption coefficient of the water. Gilcreas and De Lalla[2] determined the efficiency of a commercial device in treating Albany tap water from a surface supply and studied the interference of added color, turbidity, and colloidal iron compounds. They found that with turbidity of 85 ppm, iron 3 ppm, color (inorganic) 90 ppm, or with turbidity of 15 ppm, iron 5 ppm, and color 150 ppm, effective destruction of coliform organisms was accomplished at the rated capacity of the equipment.

As to the relative efficiency of ultraviolet light in destruction of microorganisms other than those of the coliform group, Chaumeau[3] lists the following comparative exposure times required for the destruction of some common microorganisms: staphylococci, 5-10 seconds; cholera, 10-15; coli, 15-20; typhoid, 10-20; dysentery, 10-20; pneumobacilli, 15-30; subtilis, 30-40; tetanus, 20-60. Buttolph, Haynes, and Matelsky[4] give the following radiation requirements, in terms of microwatts per square centimeter to kill 63.2 per cent in one minute (1 leth): Alpha streptococci and Staphylococcus aureus, 1.3; Beta hemo-

lytic streptococci and Escherichia coli, 5.3; molds, 10; and mold spores typical, 28. Kawabata and Harada[5] reported on the relative resistance of four groups of typical microorganisms in aqueous suspension in a unit utilizing a 15-watt germicidal lamp delivering an ultraviolet intensity of 90 microwatts per square centimeter. Gram-negative bacteria were found to be the least resistant. The time required to kill 99.9 per cent for gram-negative strains was found to be as follows: Proteus sp., 42 sec; Shigella sp., 47; Eberthella typhosa, 49; E. coli, 60. Gram-positive organisms had the following requirements: Group A Streptococcus, 83 seconds; Staph. aureus, 103; S. fecalis, 165; Bac. subtilis sawamura 240; Bac. subtilis spores 369. The resistance of yeasts was slightly greater, Saccharomyes sake requiring approximately 217 seconds and Willia anomala 420 seconds.

Pilot plant studies were conducted on sea water by Public Health and Fisheries Authorities of Hiroshima[6] in an apparatus designed to investigate methods for the purification of the Pacific oyster, Crassostrea gigas, using three germicidal units similar in design to that of Kawabata and Harada,[5] with rather high rates of flow however. Water from a tank containing oysters was recirculated to provide a replacement of about one-half of the total volume of the tank per hour. A reduction of approximately 90 per cent in coliform density was accomplished in one passage through the ultraviolet unit. Pilot scale studies on the efficiency of ultraviolet radiation in the sterilization of sea water were also conducted by Kamimura and Suzuki[7] at Matoya Bay, Japan, utilizing a unit provided with a total of six 15-watt germicidal lamps. Flow through the unit was at the rate of 12 gallons per minute. Approximately 90 per cent of the bacteria were killed by a 15-second exposure.

In all of the semicommercial size units designed for the purification of shellfish, including one recently developed in England,[8] there appears a similar principle. The ultraviolet units are of such capacity that by recirculation of the water there will be accomplished a destruction of bacteria concurrent with the use of the water for purification of shellfish. The water is not completely sterilized in the initial passage through the treatment system. The rate of destruction, although slow, accomplishes purification of the sea water to a low and acceptable coliform level by continuous recirculation during the 24-hour period of treatment, and the water presented to the oyster some four to six hours prior to the completion of the treatment period is practically zero in coliform content.

This principle is not acceptable in American practice. The Public Health Service Manual of Recommended Practice for the Sanitary Control of the Shellfish Industry[9] stipulates that water used for purification of shellfish, if treated, should meet the Public Health Service Drinking Water Standards.[10] Thus, the coliform density of the water must be such that not more than 10 per cent of the 10 milliliter portions tested shall show the presence of organisms of the coliform group. Occasionally three or more of the 10 milliliter portions may be positive for coliform organisms, provided that this density shall not occur in more than 5 per cent of the samples when 20 or more of the samples are examined per month. To meet this bacteriologic requirement, the ultraviolet treatment unit would need to be of much greater killing power than those used in commercial or semicommercial establishments in foreign countries.

During the course of laboratory experiments on shellfish conducted at Pensacola, Fla., and at Purdy, Wash., we have had occasion to design and to evaluate ultraviolet treatment units of

a high degree of efficiency in the sterilization of sea water. The units were designed primarily for use in laboratory experiments to determine the rate of bacterial accumulation by shellfish. In these experiments, oysters in laboratory tanks were furnished flowing sea water artificially polluted by the continuous addition of suspensions of coliform organisms. Samples of water and oysters were examined periodically for coliform density and from these tests the rate and extent of accumulation of bacteria by the oysters were determined. Obviously, a requirement for the proper operation of these studies was a constant load of coliform organisms in the water. Since the sea water proved to be extremely variable in coliform content it became necessary to treat the water to reduce the native coliform content to a constant level. Reduction to zero density was considered to be the easiest and most practical.

Preliminary experiments indicated that chlorination resulted in the production of a water not acceptable to the oysters. Studies at Pensacola[11] demonstrated that the feeding activity of oysters was adversely affected by chlorination and dechlorination of sea water. Therefore, other methods of removal or destruction of coliform organisms were considered. In an effort to avoid the harmful effects of chemicals on the activity of the oysters, it was decided to evaluate ultraviolet radiation. After having first demonstrated that ultraviolet treatment of sea water did not produce the same objectionable effect as chlorination and dechlorination, the bactericidal efficiency of the treatment units was determined.

Materials and Methods

Description of Ultraviolet Treatment Units

The ultraviolet treatment units used in these studies were of two different designs. The unit used in the studies at Pensacola (Figure 1) is a modification of an apparatus suggested by Buttolph.[4] It consists of a bottom section, essentially an open trough through which the water passes, and a top section, a reflector unit housing the ultraviolet lamps. The trough is 36 inches long, 8 inches wide and 6 inches high, with a longitudinal baffle 2½ inches high placed along the center line of the trough. Intake and discharge pipes, 2 inches in diameter, are placed on the long sides of the tank at diagonally opposite corners.

The lamp housing, fitting on the trough, is a semicylindrical arch-shaped reflector, lined with specular finish aluminum material. The unit is provided with two 30-watt ultraviolet germicidal lamps, placed so that the lamps are approximately one-half the distance from the lower edges to the center line of the reflector. When the housing is in place on the trough, the distance from the center of the lamps to the water level is 6⅛ inches.

In the Pensacola studies four such units were connected in series. Water flow through the units was at the rate of 40 liters (10.6 gallons) per minute providing a theoretical detention time in the four units of 70 seconds. Actual minimum detention time as determined by dye tests was 45 seconds. This design provided an apparatus which could easily be dismantled for cleaning. Accumulated particulate matter in the troughs, consequent in the low velocity of flow, would adversely affect the efficiency of the unit if allowed to collect over a protracted period. Accumulated deposits of dust and other materials on the lamps and reflector surfaces would also interfere with the transmission of ultraviolet energy. Accordingly, the units were cleansed daily, the troughs were flushed with flowing sea water and the lamps and reflector surfaces were wiped with a clean damp cloth.

The unit used at Purdy (Figure 2) is of much greater capacity, and some-

what different design. In two sections, it is made of wood covered with three coats of asphalt varnish. The lower section is a trough with sides and ends of 2-inch Douglas fir. A bottom of waterproof Douglas fir plywood, 5/8 inch thick is set in grooves in the ends and sides. A mastic material was applied to the grooves to form a watertight joint. The inside dimensions of the lower trough are 82 inches long by 3½ inches wide by 3¾ inches deep. Depth of the water in the trough is maintained by a weir ¾ inches high, placed 6 inches from the discharge end of the tank. A perforated distributing manifold made of 2-inch plastic pipe is provided at the intake end of the tank. Thirteen holes, 3/8 inches in diameter, are provided in the pipe for equal lateral distribution of the water. Six baffles are inserted in the tank. The baffle nearest the intake end of the tank is of the "under" type with a slit approximately 3/16 inches high at the bottom of the trough. Five "over" baffles are equally distributed between the under baffle and the discharge weir to induce a rolling motion as the water passes through the trough.

The inside dimensions of the reflector unit are 75½ inches long, 35½ inches wide, and 3¾ inches deep. The inside surface of the top of the reflector is covered with alzak specular finish aluminum material. The unit is provided with thirteen 30-watt germicidal lamps, each 36 inches long overall. When the reflector unit is in place, the distance from the center of the lamps to the

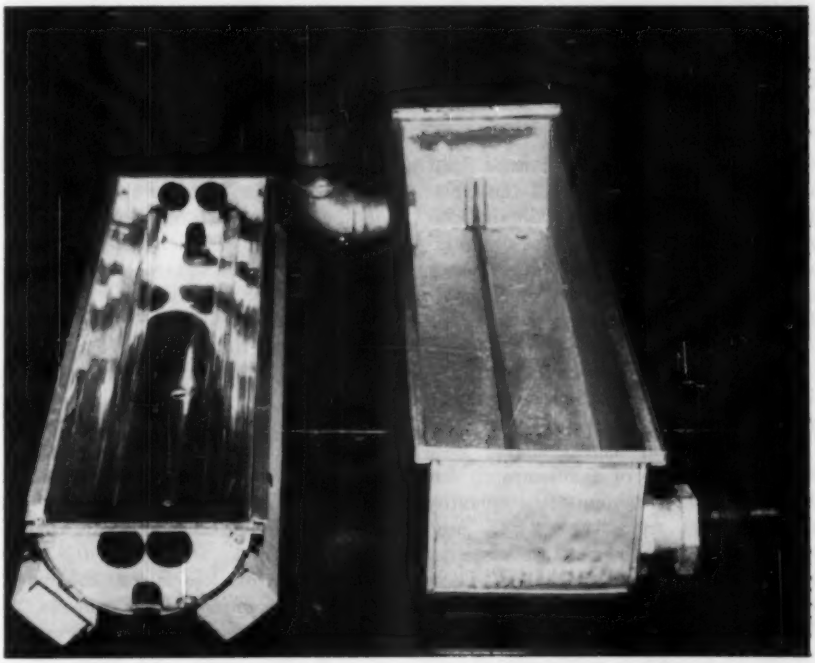

Figure 1—Ultraviolet Treatment Unit Used in Pensacola Experiments

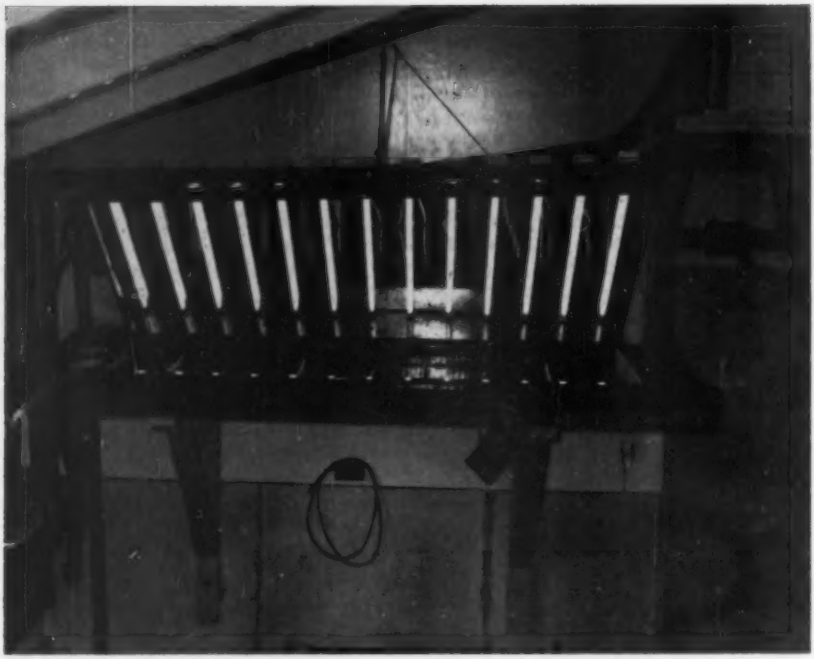

Figure 2—Purdy Ultraviolet Treatment Unit

water level is 5½ inches. Forced draft ventilation of the interior of the treatment unit is provided to maintain optimum operation temperature of the ultraviolet lamps. Two squirrel cage blower units, each with a capacity of 60 cubic feet of air per minute, are installed on the discharge end of the reflector unit. Air enters the unit through holes 1¼ inches in diameter drilled into the intake end.

From technical data available from the manufacturer of the lamps, it has been possible to compute the quantity of ultraviolet energy, at 2,537 Angstroms, reaching the water surface by direct radiation from the lamps. These computations were based on that derived by direct radiation only. It is likely that the actual amount of energy available at the surface is 20 to 30 per cent greater. We have computed that a total of 57.1 ultraviolet watts reached the entire area of the water surface, making an intensity of 3,840 microwatts of ultraviolet energy per square centimeter.

Preliminary experiments with the ultraviolet treatment unit indicated that at least 150 liters (39.6 gallons) per minute could be treated with a high degree of destruction of coliform organisms. At this rate of flow the theoretical detention time in the treatment trough is 20 seconds, and the actual detention time as determined by dye tests is 15 seconds. The amount of ultraviolet energy then reaching the water at this rate of flow is 960 microwatts per square centimeter per minute. We realize that this is considerably in excess of the design data furnished by some of the manufacturers as well as

the intensities prevailing in other installations. However, as previously mentioned we were interested in accomplishing as near 100 per cent kill as possible, with an extremely high degree of confidence.

Results

Influence of Chlorination of Sea Water on Feeding Activity of Oysters

Experiments at Pensacola[11] demonstrated that chlorinated and dechlorinated sea water had an adverse effect on feeding activity of the eastern oyster, Crassostrea virginica. Similar studies conducted at Purdy with the Olympia oyster, Ostrea lurida, demonstrated the same effect. Comparative activity of Olympia oysters furnished untreated and chlorinated, dechlorinated sea water is presented in Table 1. Chlorine dose was sufficient to produce a residual of 0.2 to 0.5 ppm after five minutes contact and the water was dechlorinated with an excess of sodium thiosulfate. Activity was determined by the presence of fecal deposits. The adverse effect of chlorination can be seen by the distinct differences between per cent activity observed in the "treated" and "untreated" flats.

Similar experiments, using ultraviolet treated water, demonstrated that this method of treatment did not produce the same effect. The results of a series of four experiments are presented in Table 2. It can be seen that there was little if any difference in the per cent activity between oysters receiving treated and untreated water.

Germicidal Efficiency of UV Treatment Units

The efficiency of the units used at Pensacola was first determined in preliminary experiments with artificially polluted sea water. Sea water was seeded with sufficient cotton-filtered raw sewage to produce coliform loads up to MPN 7,900 per 100 ml. The sewage was introduced continuously into the sea water by means of a proportionating pump. The polluted sea water was then allowed to flow through the ultraviolet treatment units at the rate of 40 liters per minute. Twenty-five sets of samples were examined during the course of experiments conducted on three days. The units consistently reduced the coliform density of the water to less than 1.8 organisms per 100 ml (negative in five 10 ml volumes tested). The raw water coliform MPN's ranged from 79 to 7,900, with a median of 2,200 per 100 ml.

Table 1—Influence of Chlorinated and Dechlorinated Sea Water on Feeding Activity of Olympia Oysters

Treatment of Water for Test Tank	Test Period Hours	Water Temp. ° C	Per cent Activity	
			Treated	Untreated
Chlorination and dechlorination; water flowing through	12	9	21	57
	11	8	29	50
	31	8.5	30	57
	23	8	40	71
None (both tanks supplied untreated water)	21	8	59	60
	23	8.5	66	65

Table 2—Influence of UV Treated Sea Water on Feeding Activity of Olympia Oysters

Test Period Hours	Water Temp. ° C	Per cent Activity	
		Treated	Untreated
23	10	91	88
22	10	90	87
22	9	90	88
34	9	94	96

The apparatus used at Purdy was also evaluated prior to operating the unit in the routine experiments. The results of these tests are presented in Table 3. Five series of tests were conducted. As in the experiments at Pensacola, the sea water was seeded with cotton-filtered raw sewage to produce the coliform densities shown. The Purdy experiments, however, were augmented to allow the collection of more information concerning the efficiency of this method of sterilization. In the coliform determinations, combinations of 100, 10, and 1 ml portions, five replicates per dilution, were planted in lauryl sulfate broth. In the Pensacola experiments the largest portion planted was 10 ml. In addition to the coliform tests, plate counts at 35° C and at 20° C were determined on the raw water and the treated water. The 35° C plate counts were conducted on tryptone glucose extract agar, incubated for 24 hours. The 20° C plate counts were conducted on MacLeod's[12] basal medium incubated for five days. Water flow through the unit was maintained at 60 liters per minute in two of the experiments and at 100 liters per minute in three. The experiments conducted with eight lamps at a flow of 100 liters per minute showed a lower per cent removal of plate count, although the destruction of coliform organisms appeared to be not affected by the higher rate of flow. In experiment 5, the

Table 3—Bactericidal Efficiency of Purdy Ultraviolet Treatment Unit

Exp. No.	Flow L/Min	Lamps	Raw Water			Treated Water			Per cent Reduction		
			Coliform MPN per 100 Ml	Plate Count per Ml 35° C	Plate Count per Ml 20° C	Coliform MPN per 100 Ml	Plate Count per Ml 35° C	Plate Count per Ml 20° C	Coliform MPN per 100 Ml	Plate Count per Ml 35° C	Plate Count per Ml 20° C
1	60	8	390	49	160	<0.18	2	3	>99.95	95.9	98.1
2	60	8	600	210	220	<0.18	0.6	1.2	>99.97	99.71	99.4
3	100	8	510	27	200	<0.18	4	14	>99.96	85.2	93.0
4	100	8	580	150	290	<0.20	1.4	7	>99.96	99.1	97.5
5	100	13	260	78	740	<0.18	0.2	0.5	>99.94	99.74	99.93

UV radiation was increased by the addition of five lamps and the results indicate that this added radiation produced exceedingly high reductions in 35° and 20° plate counts as well as in coliform organisms.

In an attempt to determine the bacterial types that were resistant to the ultraviolet radiation, identification was made of the types of organisms present in colonies on the tryptone glucose agar and the MacLeod's agar plates inoculated with ultraviolet treated water. Thirty such cultures were examined. Nineteen were found to be Pseudomanas, two were Achromobacteria, one Flavobacterium, one Micrococcus, and one Cytophaga. Although cultures from the untreated water were found to contain Bacilli and Vibrio in addition to the above, the latter two bacterial types were not isolated from the ultraviolet treated water.

Results of Pilot Plant Studies

Information on the efficiency of UV treatment under pilot plant conditions was obtained during the course of experiments on the accumulation of bacteria by oysters. In the Pensacola experiments, the performance of the unit was tested periodically by the examination of samples of water, as discharged from the treatment unit, and water and oysters in a tank, used as a control, which was fed UV treated water. A summary of the results obtained in 18 experiments, conducted during a period of nine months, is presented in Table 4.

Of the 176 samples of UV treated effluent, 98.3 per cent showed the absence of coliform organisms from three 100 ml portions, equivalent to MPN less than 0.41. Two, or 1.2 per cent, of the samples showed one of the three 100 ml portions to be positive for coliform organisms and one showed an MPN of more than 0.41 per 100 ml. Of the 257 samples of water examined from control flat C, 95 per cent showed the absence of coliform organisms from five 10 ml volumes, 3.1 per cent showed coliform MPN's between 2.0 and 4.5 (one or two 10 ml portions positive) and 1.9 per cent showed coliform MPN's in excess of 7.8. Oysters in the control tank were also examined. More than three-quarters of 257 samples tested showed the absence of coliform organisms from 1 gm quantities, equivalent to MPN less than 18, and 95 per cent showed coliform densities of less than 45.

At Purdy, comparative raw water and UV treated water MPN's were determined during the course of eight experiments on the rate of accumulation and elimination of bacteria by oysters conducted from November, 1959, to June, 1960. The results are shown in Table 5. A total of 95 samples of raw water were tested for coliform density. The coliform MPN of the raw water ranged from less than 1.8 to 2,400 and the geometric mean was 32. All but

Table 4—Coliform MPN's of Ultraviolet Treated Sea Water and of Water and Oysters from Control Flat C

	Water, UV Effluent MPN			Water, Flat C MPN			Oyster, Flat C MPN			
	<0.41	0.41	>0.41	<1.8	2.0-4.5	>7.8	<18	20-45	78-490	>490
No.*	173	2	1	244	8	5	200	45	11	2
%†	98.3	1.2	0.5	95	3.1	1.9	77.5	17.5	4.3	0.8

* Number of samples showing stated coliform MPN's or less.
† Per cent of total samples of each type examined.

Table 5—Coliform MPN of UV Treatment Tank Effluent and Water in Control Oyster Tank

MPN per 100 Ml	Number of Samples		Per cent		Cumulative Per cent	
	UV Treated	Tank C	UV Treated	Tank C	UV Treated	Tank C
<0.18	91	73	95.8	93.6	95.8	93.6
0.20	4	2	4.2	2.56	100.0	96.1
0.68	0	1	—	1.28		97.4
2.3	0	1	—	1.28		98.7
>13	0	1	—	1.28		100.0
Total samples	95	78				

four of the 95 samples of the effluent from the ultraviolet treatment system collected simultaneously showed the absence of coliform organisms from five 100 ml portions, equivalent to an MPN of less than 0.18. Each of the four samples showing positive coliform results were found to have one of five 100 ml portions positive, equivalent to an MPN of 0.2 per 100 ml.

During the same experiments, 78 samples of water were taken from the control tank containing oysters and receiving ultraviolet treated water. The distribution of coliform MPN's is shown in Table 5. Seventy-three, or approximately 94 per cent, showed the absence of coliform organisms from 100 ml volumes. Of the remaining five samples, two were at MPN 0.2 and one each at MPN 0.68, 2.3 and greater than 13.

The turbidity of 91 raw water samples was determined by comparison with standard turbidity suspensions prepared as described in Standard Methods.[13] To test the effect of turbidity on the efficiency of ultraviolet radiation, the samples were sorted into four turbidity ranges; i.e., zero to trace, 1 to 5, 6 to 10, and 11 to 20. From these plots the average and 90 per cent probability range of occurrence were derived.

The ranges of coliforms MPN of the raw water and the geometric averages at three turbidities are presented in Table 6. A progressive increase in coliform MPN, parallel with the increase in turbidity, can be seen. The results obtained on the samples of treated water are also presented in Table 5 in terms of percentages of samples in each turbidity group showing coliform MPN's less than 0.18, 0.2, and greater than 0.2.

The effect of turbidity on the germicidal efficiency of the treatment unit can be seen only from the increase in percentage occurrence of MPN 0.2 with increases in turbidity. It should be noted that, although coliform organisms were recovered from treated water samples, the highest density determined was 0.2 per 100 ml, even in the presence of turbidities up to 20 ppm.

Discussion

The use of chlorine for the sterilization of sea water in shellfish purification plants is contraindicated, since it has been established that chlorine has an adverse effect on the feeding activity of both the Eastern oyster and the Olympia oyster. Further, the experiments have demonstrated that dechlorination does not remove the factor which influences the feeding activity. On the other hand, it has been demonstrated that ultraviolet treated water does not have

a similar effect and there is experimental evidence to demonstrate that oysters will purify themselves in such water. Turbidities of up to 20 ppm did not seriously interfere with efficiency of the Purdy ultraviolet treatment unit. Obviously, a water containing gross particles of particulate matter should be clarified by settling to be acceptable for ultraviolet treatment.

There are at the present time means for measuring the efficiency of operation of the ultraviolet lamps. A germicidal watt meter is available to measure the direct ultraviolet output of the lamps. Instruments for measuring ultraviolet intensity at short distances from bare tubes such as might be desired in ultraviolet treatment units are available and more sensitive meters can be obtained to measure the intensity at greater distances. All can be combined with suitable electronic recording devices to produce a continuous record of the UV energy applied to the water.

Summary

Data from the results of experiments on both artificially polluted sea water, and on sea water containing coliform organisms up to a density of 2,400 occurring naturally in the water, indicate that ultraviolet radiation is an effective means of destruction of coliform organisms. The unit developed for the treatment of sea water in the laboratory experiments on oysters at Purdy, Wash., is of a design and capacity sufficient to evaluate the applicability of ultraviolet radiation in at least small scale commercial installations. The unit accomplished more than 99.96 per cent reduction of coliform organisms from a sea water seeded with sewage and having an average coliform MPN of as high as 580 per 100 ml. Percentage reduction in 35° and 20° plate counts were of the same order.

Pilot scale studies conducted over extended periods have demonstrated that, with proper maintenance, the unit will operate at a high degree of dependability. With raw water ranging in coliform MPN's up to 2,400 per 100 ml, and turbidity up to 20 ppm, only 5 per cent of 91 samples of UV treated water examined during a period of eight months showed the presence of coliform organisms in 100 ml volumes tested. The maximum MPN of the treated water was 0.2 per 100 ml. The maintenance requirements of these units are of the simple housekeeping nature. For proper operation the units should be flushed periodically and the lamps and reflectors cleaned to remove accumulated deposits.

Table 6—Effect of Turbidity on Efficiency of UV Treatment Units

Turbidity Range	Number of Samples	Raw Water Coliform MPN/100 Ml Average	Raw Water Coliform MPN/100 Ml Range	UV Treated Water Per cent of Samples Showing Coliform MPN <0.18	UV Treated Water Per cent of Samples Showing Coliform MPN 0.2	UV Treated Water Per cent of Samples Showing Coliform MPN 0.2+
0-trace	40	17	<1.8- 330	100.0	0.0	0
1-5	24	17	<1.8- 240	92.0	8.0	0
6-10	18	61	7.8- 920	94.4	5.6	0
11-20	9	160	23.0-2400	87.5	12.5	0
0-20 (All samples)	91	32	<1.8-2400	95.8	4.2	0

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This paper was presented before the Laboratory Section of the American Public Health Association at the Eighty-Eighth Annual Meeting in San Francisco, Calif., November 2, 1960.

Based on Known Needs

From the Health Division, Alaska Department of Health and Welfare, comes a new Foster Parents Manual to help these parents care for a sizable number of children brought from all over the state to the principal cities for the receipt of medical care. Most interesting —experienced foster parents themselves, mothers primarily, prepared this booklet under the guidance of a medical social worker. The content is thus practical, being based on the known needs of those who will use the manual. It includes sections on planning before placement, appointments for treatment (excellently detailed), preparations for sending the child home, what information must be given the social worker, and wise hints to new foster mothers. The Health Division is in Juneau and may provide the inquirer with a sample copy of the manual.

Most home care programs are hospital-based. A program administered by a Visiting Nurse Association is presented in the following paper. Some of the problems involved are discussed and the values to the community are emphasized.

THE HOME CARE PROGRAM OF THE DETROIT VISITING NURSE ASSOCIATION

Sylvia Peabody, R.N.

THERE is today considerable interest in the development of home care programs across the country. Most programs of this kind are based in hospitals. Because the Detroit Visiting Nurse Association is one of the few public health nursing agencies that has experimented with administering such a program, I have been asked to describe the program and what it means to the agency and the community.

The Home Care Demonstration of the Detroit Visiting Nurse Association was organized in July, 1955, as a coordinated service for long-term patients at home who were under the care of practicing physicians. The program offered physicians a total community service for their patients. Through referral to this program their patients could receive a variety of services given by this agency, as well as the services of other appropriate community agencies which through coordinated efforts could try to meet the medical, nursing, social, rehabilitative, and economic needs of these patients.

Community interest in a home care program was stimulated by activities of the National Commission on Chronic Illness in 1955. Their concern was to find a way to help the ever increasing numbers of chronically ill and disabled. The intention was to develop a hospital-based program, but none of the Detroit hospitals wanted to undertake such a project. The Board of the Detroit Visiting Nurse Association was disappointed that this idea was not going to develop. So with the stimulation of the McGregor Fund in providing $25,000 a year for a three-year demonstration, the Board of the Visiting Nurse Association agreed to undertake the project of developing an agency-based demonstration program. It seemed feasible since the Visiting Nurse Association would provide the major service to any home care program.

Organization and Administration

The board appointed a Home Care Steering Committee consisting of a representative of the McGregor Fund, consultants in public health administration, a hospital administrator, and members of the board and administrative staff of the Visiting Nurse Association. The steering committee assumed responsibility for planning the development of the demonstration program.

At the same time, a community advisory committee was appointed consisting primarily of representatives of the

agencies which give direct service and with whom the Visiting Nurse Association would be working to develop a coordinated service. Others represented community groups interested in the development of such a program. The advisory committee had a twofold purpose: to advise the Visiting Nurse Association as to community opinion on the development of the program, and to keep agencies and the community aware of the program and how to use it.

Staff

The director of the Visiting Nurse Association and her assistant became the directors of the Home Care Demonstration and appointed a staff of three coordinators, a physician, a nurse and a social worker, to coordinate the work within the Visiting Nurse Association and with community agencies. They were responsible for administering the program; approving admissions to and dismissals from the program; holding monthly conferences concerning each patient so as to review progress, and for making recommendations and coordinating the thinking and activities of the various workers and agencies involved. A secretary was assigned to the program to help maintain a system of records in a centralized office and compile statistical reports as the program progressed. The rest of the staff was the regular Visiting Nurse Association staff.

Criteria for Home Care Admission and Discharge

All patients referred were given service by the Visiting Nurse Association. Some were selected for admission to the Demonstration according to the following criteria: the welfare of the patient and his family warrants care in the home; the home environment can be made suitable; medical care is available in the home; the patient has a long-term disability; the patient or family has need for rehabilitation; the patient's needs require a complexity of coordinated services.

Both admission and discharge were decided at a conference with the Home Care coordinators, the district supervisor, the staff nurse, Visiting Nurse Association consultants, and representatives of other agencies involved in planning care of the patient. The criteria for discharge from the Demonstration were: the patient has recovered; the patient has reached the rehabilitation goal expected; the family can assume the patient's care with or without the help of the Visiting Nurse Association's regular service; the patient needs institutional care; failure of the patient and family to carry out the program.

Area and Facilities

The area which the Demonstration covered was the same as that covered by the Detroit Visiting Nurse Association. It includes most of a three-county area—about 1,000 square miles with a population of about three and one-half million. There are eight Visiting Nurse Association district offices, four in Detroit, and four in the suburbs. The supervisor of each district office was responsible for the care the Home Care patients received as she is for all Visiting Nurse Association patients. The staff nurses gave care to these patients, and used the consultant and specialists' services within the agency. Available to her are direct or consultant services from nutritionists, physical therapists, an occupational therapist, and a mental health nurse consultant. As an extension of her service for patients who have no family able to give interim care there are home aides who stay in the home eight hours a day. Besides the regular monthly Home Care conferences, the nurse could consult the Home Care coordinators—physician, social worker or nurse—at any time.

The Visiting Nurse Association physical therapists give direct service to some patients while the nurse gives physical therapy to others under the direction of the physical therapist. The nurse has classes in physical therapy early in her orientation so that she can give this service to some patients with strokes, arthritis, fractured hips, and similar conditions. The therapist visits the patient with the nurse and helps her to adapt the physician's orders for physical therapy to this patient. She reviews the patient's progress with the nurse at intervals and may visit again with the nurse if necessary.

The occupational therapist works in much the same way, usually visiting the patient with the nurse, setting up a program of therapy to implement the physician's orders. The nurse helps the patient to continue the program until the occupational therapist returns to evaluate her progress and adapts the plan accordingly.

The nutritionists visit patients whose diets are complicated and, especially, where there is a home aide who has to prepare a special diet. Every patient on the Home Care Demonstration had a diet evaluation even though not on a special diet. Many of these patients are not seen by the nutritionist. However, the nurse asks the family to keep a three-day record of food intake. This food intake record is analyzed by the nutritionist with the nurse. The recommendations made by the nutritionist are interpreted to the family on the nurse's next visit. Sometimes a second food intake record is analyzed later on to evaluate progress in the patient's understanding of his diet.

The home aide service was new to the Detroit Visiting Nurse Association at about the time the Home Care Program was started in 1955. The home aides are mature women with a ninth-grade education on the average who have had no formal teaching for this position, but who are experienced in homemaking and child care. Many have had some experience in hospitals or nursing homes as nurses' aides. The orientation of the home aide includes a series of classes in simple personal care to the patient, such as giving a bed bath, making a patient comfortable, crutch walking, and a class in good nutrition. The real training, however, takes place in each patient's home to which the aide is assigned. She is taught and supervised in the home by the nurse. A written schedule of her duties is planned by the nurse with the patient and family. The duties may include personal services to the patient, light housekeeping, meal preparation, and child care. Along with the patient the aide is taught the concept of rehabilitation. A housekeeper is accustomed to doing what she is asked to by the family. When she becomes a home aide she may be asked not to do the dishes, but to stack them beside the sink, pull up the stool, help the patient onto the stool, and encourage the patient to do them herself. It takes more time and is often not as easy as if she did it herself. But with the nurse's support in this plan the aide learns that this is a therapeutic method of helping a handicapped person to become more independent.

Continuity of Patient Care—Hospital to Home

One of the problems recognized early in the program was a lack of referrals of patients recently discharged from hospitals. Public health nurses have for many years fostered plans to promote continuity of patient care from the hospital into the home. In Detroit, public health nursing agencies instigated the development of a "Continuing Patient Care" form which is now used by most hospitals and agencies for referrals. It is a good form but does not guarantee that patients who need service at home will be referred.

Various methods of publicity were used in the early phase of the Home Care Demonstration to reach the physician and encourage his early referral. Talks to medical groups, articles in medical magazines, and individual physician contact brought minimal results. Hospital-based home care programs have a real advantage here in that the physician can easily be approached about his patients in the hospital to plan for home care. In the third year of the Demonstration the Home Care Steering Committee invited the administrators of four general hospitals in the city to discuss this problem, and gained their cooperation in starting an experimental program to promote continuity of patient care. In March, 1958, a public health nurse was assigned to one of the hospitals to be the liaison between the hospital and the Visiting Nurse Association. She was in the hospital three mornings a week and met with various hospital personnel to let them know about the program and her role. She and the home care medical coordinator met with the medical staffs to introduce the program to the physicians on the staff. She made rounds in the hospital on each visit discussing patients with physicians, telling them of services available, and often getting referrals in this way. With the physician's approval she then talked with the patient about the program and plan for referral. Another method of case finding was to review the Kardex with the head nurse who could give her some idea of patients who might have a need for service at home. From these ideas she could then approach physicians who might not have recognized that their patients could benefit from the Home Care Demonstration. The response was good and some physicians said her presence in her navy uniform reminded them of patients to discuss with her, and this actually stimulated referrals. This plan of providing a visiting nurse as a liaison between hospital and home was extended to three other hospitals during the Demonstration. On the basis of this experiment the McGregor Fund extended their grant for a fourth year, making a total of $100,000 which they gave for the Demonstration.

There were problems in this plan, but it was a learning experience which has served as well in the present phase of the program. One problem was that while the visiting nurse was welcomed in each hospital, she had no authority and no one within the hospital had any real responsibility for helping her. She was there three mornings a week, but patients were discharged at other times and often planned referrals were not made. Some head nurses did take responsibility for seeing that it was carried through, others did not. Some took initiative in asking to discuss cases with the visiting nurse or discussed the possible need for referral with the physician, others did not. There were changes in personnel that made it difficult at times to know that a plan for referral would be carried out. As the program was introduced to new hospitals a commitment was required of the hospital to assign a nurse to the program. It was hoped that after several months of working with the visiting nurse the hospital nurse would assume the role of liaison and the visiting nurse could be withdrawn. In all the hospitals where the visiting nurse has been withdrawn the level of referrals has dropped to about the average for that hospital before the program.

One other problem in working through the hospital was that patients who could have been discharged earlier sometimes refused when they learned there was a fee for Home Care services. They sometimes chose to stay in the hospital longer since their hospital insurance paid for everything while they were there. Some employee groups in Michigan are covered for 365 days of hospital care. Under these circumstances it is hard to persuade patients they would be better off at

home. However, in Detroit many of the hospitals are crowded, with waiting lists, so that there is pressure by the hospitals on physicians to discharge patients as soon as acute care is over. Physicians themselves recognized the value of making beds available by discharging patients to Home Care for the convalescent or rehabilitative period and even for terminal care. Many patients also were pleased that services could be given at home. Sometimes family problems caused by a mother's hospitalization could be relieved by having her in the home as early as possible after the acute phase of illness. Even if she were physically unable to care for herself and the home and children, she could give direction to the children, plan the meals, and manage the household although a family member or home aide might have to do the physical work.

Results and Costs

In December, 1959, the Home Care Demonstration ended. During the four years, 440 patients were admitted to the program. They were all long-term patients who required a multiplicity of services and were under the care of private physicians. Sixty-five per cent of these patients were in the age group 25-65. The average stay on Home Care was 167 days. They had an average of 41.3 professional visits per patient. Seventy per cent of the patients were found to be markedly improved at the time of their discharge from the program. When admitted only 4 per cent had complete mobility—were able to get about unassisted. At the time of discharge 35 per cent had reached this goal.

Analyzing the cost of such a program is difficult because the cost of services given by other agencies could not be obtained. Forty-four per cent of the patients had service from agencies other than the Visiting Nurse Association. The average cost of Visiting Nurse Association services for each patient per day was $4.34. This includes professional visits, home aide service, and the administrative costs. The McGregor Fund Grant covered only the administrative costs. Fees from patients and from other agencies paid for about 30 per cent of the direct service, and the United Community Services budget paid for the remaining 70 per cent.

Blue Cross Pilot Study

Throughout the Demonstration period one of the objectives was to interest prepaid hospital insurance plans in including a home care benefit for subscribers. There was some interest shown and a representative of Blue Cross was on the Advisory Committee. But as the Demonstration was nearing its end no action had yet been taken. The Visiting Nurse Association Board recommended to the United Community Services that this should become an ongoing Home Care Program and requested United Community Services funds to cover the administrative costs with the hope that Blue Cross would eventually come to a favorable decision. United Community Services approved the request and granted funds for the administrative costs for 1960. Thus the Demonstration ended and the Home Care Program continued in 1960.

In November, 1959, Blue Cross unexpectedly indicated an interest in developing a pilot study to include home care services as a benefit for subscribers. Its purpose, as stated by Blue Cross, is "to explore, on a controlled study basis, the advantages to patients and the effects on lengths of hospital stay which would result from the availability of organized Home Care benefits provided to selected cases." On February 1, 1960, the pilot program was started, providing home care services to Blue Cross patients discharged from four general hospitals and to employees of a small industry who

might be hospitalized in any hospital. Blue Cross pays for all Visiting Nurse Association professional visits and one-half the cost of home aide services. The family pays the other half of the home aide cost. Additional benefits provided are medical supplies, drugs, x-rays and laboratory services, which are obtained through one of the four hospitals. Blue Cross patients are eligible if referred by their physicians and if they are discharged from the hospital earlier than they would be if Home Care services were not available. The physician indicates on the referral form how many hospital days are being saved by referral to the program.

A visiting nurse goes to each hospital three mornings a week to be the liaison between the hospital and Home Care Program. Each hospital has assigned a nurse to work with the program in cooperation with the visiting nurse. The hospitals are very interested in the pilot program and take responsibility for its development. Physicians show much more interest since it is not an additional expense for their patients. Physicians' visits to the home are not paid for, however, and this may sometimes be a deterrent in discharging patients early. Patients are responding well to the opportunity to go home early and receive services in their homes at little or no expense.

When a patient is admitted to the program, Blue Cross authorizes 60 days of service and he is given a Home Care identification card which he uses to obtain his drugs, medical supplies, laboratory work, and x-rays through the hospital. At the end of the 60 days if the physician feels the patient needs further service, a renewal request is submitted to Blue Cross and, if approved, he will be authorized for an additional 30 days. Further renewals may be obtained in the same way. About 25 per cent of the cases have been renewed beyond the first 60 days. About half of these cases were renewed more than once, one having been authorized for 180 days in all.

By the end of September, 1960, 327 patients had been admitted to the Blue Cross Home Care Pilot Program, 240 of of whom were already dismissed. The average length of stay in the Blue Cross study is 47.3 days, and an average of 17 visits is made to each patient. This is very different from the 167 days on the Demonstration with 41.3 home visits.

The patients cared for on the Blue Cross Pilot Program differ from those on the original Demonstration in that there are more with short-term service needs but many are in more acute stages of illness because of early discharge from the hospital. They may need daily visits for a few weeks but may need no service after a month or six weeks. Patients on the Demonstration were more likely to need long-term rehabilitative services for from four to six months or longer. Only 4 per cent of the Blue Cross patients have had services from other agencies as compared with 44 per cent on the Demonstration. There are two reasons for these differences. First, the Blue Cross study has not functioned long enough to make comparisons valid. Second, the Demonstration patients were selected according to rather restrictive criteria. They were selected because they were long-term multiservice patients. In contrast to that, all Blue Cross patients referred are included in the pilot study so that this group of patients is much more like the general case load of the Visiting Nurse Association.

An evaluation of this pilot project is now being made by Blue Cross. As each case is closed, a professional interviewer visits the patient to get his opinion of the program through a questionnaire. This is under the direction of the Market-Opinion Research Company of Detroit. In addition, the patient's physician is sent a questionnaire in which he records

his opinion of the program. So far the results of both questionnaires are reported to be very favorable.

Some time this fall (1960), Blue Cross plans to send a team of statistical experts to the Home Care office to review the records of the patients and to evaluate the program further. The hope and expectation of the Visiting Nurse Association is that as a result of this pilot study, Blue Cross will include a home care benefit for all policyholders.

Values to the Agency and Community

The values to the Visiting Nurse Association and to the community of the development of the Home Care Demonstration and the Blue Cross Pilot Program are many. Some of them are:

1. Realization of the objective of interesting Blue Cross in including home care benefits for subscribers.
2. Development of the conference method of evaluating service to patients and setting up goals for service.
3. Efficiency of staff nurse increased by participation in the program.
4. Improved record system developed for the demonstration and used now for all patients.
5. Increased and more efficient use of other community agencies.
6. Increased referrals by physicians.
7. Continuity of patient care—hospital to home realized through the use of a visiting nurse as liaison.
8. Coordinated service to patients.
9. Release of hospital beds by earlier discharge from the hospital.

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This paper was presented before a Joint Session of the Food and Nutrition, Medical Care, and Public Health Nursing Sections of the American Public Health Association at the Eighty-Eighth Annual Meeting in San Francisco, Calif., November 2, 1960.

High But Lower

In the twelvemonth ending June 30, 1960, illness and injury caused civilian Americans not confined to long-term institutions to stay home from work, stay in bed, or otherwise cut down their usual activities for an average of 16 days per person, including six days of bed disability. The figures are well under those for the year ending June 30, 1958, in which the Asian influenza epidemic occurred. These estimates along with pertinent breakdowns of data are found in Health Statistics from the U. S. National Health Survey. Series B-No. 29. Disability Days: July 1959-June 1960. 50 pp. Available from the Government Printing Office, Washington 25, D. C.; 40 cents.

Optometrists see large numbers of people, some of whom require referral to other health personnel. This study reports on the referrals made by optometrists to ophthalmologists, general physicians and others, and suggests means for making more effective use of optometrists referrals in health care.

OPTOMETRY'S ROLE IN HEALTH MAINTENANCE— A STUDY OF REFERRALS

Galen F. Kintner, O.D.

Optometric Referrals

MOST patients seeking the services of an optometrist have, or presume to have, symptoms of disorders connected with the eyes or their use. The optometrist, in taking a careful case history, observing the patient, making various tests and in evaluating his findings, must decide if solution of the patient's problem lies within his circumscribed field. This is a differentiating activity requiring skill and understanding since many symptoms of visual disorder are similar to those manifest by a patient with general disease, dental or eye health problems. If other than optometric services are required, the optometrist refers his patient to other health professions or agencies for further attention. Thus the optometrist in his routine practice regularly originates referrals to other professions as part of his responsibility to his patients. This report is concerned with various aspects of these referrals.

The visual system is a generous window to a number of the patient's health problems. While the optometrist's area of service includes refraction and coordination problems (with lenses, orthoptics, subnormal visual aids, and the like), his field of investigation includes much more in determining the state of health of the patient and his visual system. Case histories are revealing; the reflexes of the eyes and adnexa are rich sources of neurological information; the appearance of blood vessels, tissue structure, and pigmentation are prime indicators of both general disease and localized diseases of the eye. The normal physiology and anatomy of the eyes is so well understood that any deviation from it is readily recognized by the observant optometrist.

As the optometrist originates many referrals his activities often partake of the nature of the general practitioner,[1] rather than that of a specialist. Even though the public is becoming more sophisticated in its self-diagnosis[2] and hence its choice of health specialists, the fact is that a great number of people with vague symptoms come first to the optometrist. In serving these patients the optometrist frequently consults with the general practitioner to insure correct referral. Conditions requiring medical or surgical treatment of the eyes are generally referred directly to an ophthalmologist. Close cooperation between the optometrist and the consultant contributes to more efficient use of community health resources.

Form of Referrals

Referrals[3] of patients by optometrists take many forms depending upon the factors that the patient's problem and degree of urgency may present. On the one hand it may be such an acute situation that he actually accompanies the patient to the physician conferring with him on the signs and symptoms that actuated the referral. At the other end of the scale, the optometrist may decide that the patient need only be given the recommendation that he see his physician or dentist at his early convenience. Between these two extremes are all gradations, with all types of communication between the optometrist and the other members of the health care professions to whom he sends his patient.

In general, referrals can be divided into two groups: the desirable-but-elective, and the more formal or specific referral. The former presents the larger portion of the direction of optometrists to their patients to seek the service of others. These referrals are for conditions of less than an acute nature. Dental caries, periodic health examinations, obesity, general hygiene, and such subjects of health management are examples of the matters that an optometrist typically calls to the patient's attention. Rare indeed is the older patient that does not need some encouragement for better health management.

The present study is concerned with the more formal or specific type of referral, characterized by the fact that the optometrist not only undertakes to motivate the patient to seek the services of others but also initiates the communications with the essential third party to whom the patient is referred. In this type of referral the optometrist not only determines that the patient needs the services of others but that these services are required at an early date and with more certainty than the product of casual conversation or direction. These referrals are generally made to a specific practitioner or office—always consulting the patient on his choice. Communication is between principals and typically generates more return discussion between them in the patient's interest.

To date, no information with an authoritative background was available on this subject of optometric referrals. In the development of their activities, several committees of the American Optometric Association felt that such a study would be desirable for several reasons: to provide information essential to proper development of the profession in a changing world; to provide information for the optimum development of interprofessional relations; and to develop information which could be used to improve the educational preparation of optometrists.

The Questionnaire

In order to provide a source of material for the current study on optometric referrals, a questionnaire was designed. It was mailed to a random sampling of 1,350 optometrists who were asked to return one copy each month for six consecutive months. Of the 306 who responded by returning the first month's questionnaire, 133 completed the entire series. A total of 1,360 monthly questionnaires were returned.

The questionnaire asked for information on the optometrist's age and length of practice, the population of his city, and the number of patient visits for that month. It asked about the number of eye physicians in the locality and the number of miles to the nearest eye physician. The age and sex of each patient referred that month and the number of years the patient had been served were included. Referrals were categorized to ophthalmologists, general practitioners of medicine, dentists, other

Table 1—Geographical Distribution of Replies to Questionnaire

State	Number of Monthly Replies	Number of Patient Visits*	Number of Referrals	Percentage of Referrals to Patient Visits
California				
Rural	41	6,826	166	2.43
Urban	151	26,164	722	2.76
Florida				
Rural	54	8,155	304	3.73
Urban	97	21,346	347	1.62
Illinois				
Rural	95	17,901	357	1.99
Urban	55	9,758	291	2.98
Massachusetts				
Rural	38	6,137	102	1.66
Urban	76	10,404	222	2.13
Michigan				
Rural	64	9,394	179	1.90
Urban	88	20,156	320	1.59
Pennsylvania				
Rural	93	11,688	322	2.75
Urban	93	16,800	236	1.40
Texas				
Rural	25	3,972	57	1.44
Urban	94	14,292	194	1.35
Other states				
Rural	103	16,184	403	2.49
Urban	193	36,135	924	2.56
Total of all states				
Rural	513	80,257	1,890	2.35
Urban	847	155,055	3,256	2.10
Grand total	1,360	235,312	5,146	2.19

* The term "patient visit" means visits to the optometrist for any reason. It is estimated that the refracted patient uses 2¼ visits in connection with one refraction.

optometrists, and other health personnel, and their record of formal acknowledgment of the patient's appearance was listed.

Distribution of Referrals

Responses to the questionnaire were well distributed geographically with a fair division between urban and rural areas as shown by Table 1. There was no essential difference between the data from rural and urban areas. In four states the urban optometrists referred more patients and in four others the rural referrals were greater.

As near as can be determined, there are 18,500 optometrists in active practice in this country at the present time. If these data are projected on the basis

of the total number of optometrists in active practice, it can be estimated that in the United States optometrists received 37,368,000 patient visits annually. Of these, 818,360 patients are formally referred to others for some type of health service.

Of all formal referrals, 86.55 per cent were made to some branch of medicine. As would be expected, the larger share of referrals was made to ophthalmologists; 53.7 per cent being made to them and 32.8 per cent to general practitioners. Referrals to the general practitioner would be greater if full data on the desirable-but-elective type of referral were available. According to the study, 3.3 per cent of the formal referrals were made to dentists. Of the balance, 5.1 per cent were made to other optometrists and 5 per cent to other miscellaneous health care personnel.

If this same distribution holds for the entire optometric profession, it would be projected to the following annual total of referrals:

Ophthalmology	439,460	patients
General practice	271,622	"
Dentistry	26,990	"
Optometrists	41,736	"
Miscellaneous	40,918	"

Referrals by Age of Optometrist

In order to determine if there were any significant difference in referrals among older and younger optometrists, or in the number of years in practice, the data in Tables 2 and 3 were compiled. These tables show a higher rate of referrals by older optometrists, though the returns from those over age 65 were too few to be fully significant. The higher percentage of referrals by the older optometrist reflects the higher average age of his patients which keeps pace with his own increased years.[4] The incidence of health problems increases with the age of the patient. This pattern holds true when referrals are grouped in accordance with the number of years the optometrist has been in practice. The rate of referrals increases with the number of years, with a significant jump when the optometrist arrives at the 51-65 age level or has been in practice from 16 to 30 years. Referrals to his colleagues also increase from less than 1 per cent on the under-50 group to 5.5 per cent in the over-50 group.

Referrals by Sex

There were 2,543 females and 2,076 males referred by optometrists in this study. This represents 81.6 males to 100 females, and follows closely the study made of optometric practices in California, in 1956.[5] It demonstrates that the optometrist sees 80.8 males to 100 females in his regular practice.

Acknowledgment of Referrals

The best interests of the public are served when there is full and free communication between the optometrist and

Table 2—Referrals Related to Age of Optometrist

Age of Optometrist	Percentage of Total Patient Visits Referred to					
	Ophthalmologist	G.P.	Dentist	Other Optometrist	Others	All Referred
Under 30	1.36	1.74	0.04	0.14	0.11	3.40
30-40	1.18	0.86	0.09	0.01	0.13	2.31
41-50	1.06	0.68	0.08	0.20	0.12	2.14
51-65	2.40	0.51	0.04	0.08	0.09	3.16
Over 65	2.84	0.25	0.03	0.06	0.03	6.42

Table 3—Referrals Related to Number of Years in Practice

Years in Practice	Percentage of Total Patient Visits Referred to					
	Ophthalmologist	G.P.	Dentist	Other Optometrist	Others	All Referred
Under 5	1.23	1.29	0.06	0.07	0.16	2.83
6-15	1.12	0.83	0.10	0.06	0.10	2.20
16-30	2.09	0.81	0.11	0.31	0.15	3.46
Over 30	2.21	0.66	0.07	0.13	0.15	3.25

the professional to whom the patient is referred. The findings of the optometrist contribute to the understanding and remedial care of patients whom he refers. The knowledge communicated[3] to the optometrist adds to the latter's learning and skills. It also helps him to plan the subsequent visual care of the patient who was referred.

Of the 2,772 referrals that were directed to ophthalmologists in this study, 71.3 per cent were acknowledged, either in conversation or by written communication. Of the 1,683 referrals to physicians in general practice, 45.5 per cent were acknowledged. The difference is significant and may be explained by several factors. The greater area of mutual interest increases the frequency of communications between optometrists and ophthalmologists. The fact that the number of ophthalmologists is smaller than that of general practitioners means more referrals to individual eye physicians by optometrists. This, in turn, builds a greater rapport between the two. Also, by the very nature of their practice, most specialists are more adept at maintaining communications with those who refer to them.[6]

Future Study

This study of formal referrals, from optometrists to other health professions, points to other avenues for enquiry and study. It would be desirable to make a broader study, covering a more representative group of optometrists, and giving more attention to desirable-but-elective type of referral. It should include a search for information on better screening methods and procedures for determination by optometrists of any deviation from normal function. A study could be made of communications between optometrists and other professional people. This could point out the relationship of frequency of referrals to their acknowledgment. It might be directed to searching for better technics for communication between professional people. It would be desirable to know what constitutes a "patient visit" at an optometrist's office, and what relationship exists as to frequency among various kinds of visits.

Conclusions

1. Optometrists see a large volume of patients, many of whom exhibit signs and register symptoms of disease and malfunction that fall outside the scope of their service. If the present sampling is projected to the 18,500 optometrists in active service, it represents 37,368,000 patient visits per year.

2. Projecting the 2.19 per cent referrals to patient visits in this study shows that optometrists refer 818,360 people to others for health services.

3. The greater share (53.7 per cent) of optometric referrals is made to ophthalmologists according to this study. This represents 439,460 patients.

4. The next larger group of referrals (32.8 per cent) is sent to general medical practitioners. This represents about 271,622 of this type of referral.

5. A smaller group of referrals (3.3 per cent) was made to dentists.

6. Optometry represents a considerable health resource. Its role in the maintenance of health could be developed more effectively.

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Diabetes Detection: A New Film and Pamphlet

The first movie to be made by the Public Affairs Committee, a nonprofit educational organization that has been publishing popular pamphlets for the past 25 years, is "Diabetics Unknown." The PAC undertook the project as a result of a survey of state health departments which indicated a great need for a diabetes detection film for the lay public, an estimated million and a half of whom are undiagnosed diabetics. The film and a pamphlet that accompanies it were produced with the co-sponsorship of the Conference of State and Territorial Directors of Public Health Education.

This heartwinning documentary opens with the man-on-the-street interview technic applied to several willing talkers, many of whom are diabetics. As the film proceeds the narrator, Dr. Francis D. W. Lukens, gives medical and background information while patients described how they discovered they had diabetes, what they are doing about it, how it affects their lives.

The film runs 22½ minutes and is followed by 6½ minutes of filmed panel discussion. The total of 29 minutes is a suitable length for educational television showings.

The panel discussion is led by Joan Wolle, M.P.H., director of health education, Maryland State Department of Health. The participants are Dr. Lukens, Dr. Arthur Krosnick who heads the New Jersey State Department of Health's diabetes control program, and Dr. Kare Gundersen, a diabetes researcher in Boston.

The film is in black and white, prints sell for $75, and rental prints are available at $7.50 per showing. Further details from Public Affairs Film Library, 267 West 25th Street, New York 1, N. Y.

How and why do people learn or why don't they learn? These questions and related matters are discussed in this paper. By cutting through the jargon with which discussions of learning are cluttered up, the author has performed a very useful service.

THE LEARNING PROCESS

Robert J. Havighurst, Ph.D.

IN LOOKING at the learning process we come face to face with the problem and the process of human perfectibility. Human beings improve themselves by learning. If and when they lose the capacity to learn they lose the power of improvement.

The learning process in adult man has been studied as though it was the same as that of an eight-year-old child; and it has also been studied as though it was a function of a decaying brain which was never as good in adult life as it is at age 18.

These ways of looking at the learning process have taught us something, and we certainly know a great deal more about it than we did at the beginning of the 20th century, when modern psychology was getting started. However, we also know that the learning process is an extremely complicated affair, in man and in beast, in the young and in the old.

Today, no one tries to deal with the whole learning process as it is found in life. For this paper we shall restrict ourselves to some comments and questions about the learning process in human adults.

Learning is an experience that results in changed behavior.

The Laws of Learning

The early studies of learning, especially with students and with animals other than man, led to two broad laws of learning.

The "Law of Use" or of repetition said that learning takes place when one repeats the behavior to be learned over and over again. Thus a child learns to spell, or to multiply, or to play the piano by practicing over and over again until he is "letter perfect."

The "Law of Effect" said that learning takes place most rapidly and permanently when there is a reward of some kind associated with the behavior to be learned. Thus the learned behavior is re-enforced, and other possible kinds of behavior in the situation are dropped out of a person's repertory. A child will learn to read or to multiply more rapidly if he is rewarded for success. His reward may consist of something tangible, like candy or money, or something intangible but no less rewarding, such as the approval of his parents or his teacher or his age-mates.

A part of the Law of Effect has to do with punishment, or negative reward. A person may learn a new kind of behavior in order to avoid punishment. Thus a child who has been burnt by a hot radiator learns in only one experience to stay away from the part of the room where the radiator is.

Since the early days of the study of learning both of these basic laws have been explored and qualified in many ways. More interest has been shown by psychologists and by teachers in

the ramifications of the Law of Effect. It became evident that efficiency of learning could be multiplied a hundred or even a thousand times by skillful use of rewards or appeals to the self-rewarding machinery of a person—that is, his motives.

Many things can be learned in only one experience, provided the experience has enough reward or punishment connected with it. Other things can hardly be learned after a thousand attempts.

The man who is overweight but does not learn to diet may do so very quickly after he suffers a heart attack, which is a punishment. The confirmed cigarette smoker may try to break the habit a hundred times with no success, and then something may happen to frighten him and he may learn to do without cigarettes on the 101st attempt.

The Levels of Learning

Let us distinguish three levels of learning:

A. The change in behavior that is learned is limited to the verbal level. For example, one may learn a set of nonsense syllables, or the Russian alphabet, or the names of the countries making up the United Nations.

B. The behavioral change takes place at the level of will or of appreciation. At the level of will one may learn to favor the abolition of H-bomb testing or to disfavor the fluoridation of drinking water. At the similar level of appreciation or enjoyment one may learn to enjoy calypso music or to dislike abstract art.

C. The behavioral change takes place at the level of physically effective action. A person learns to swim or to kick a football; or to speak Spanish; or to go to a doctor periodically for a medical examination; or to invest money in real estate; or to sit in a tavern every afternoon and talk and drink with his friends.

The goal of learning is seldom at the A or verbal level for adults or for children after they have learned the elemental memory facts. In fact, the verbal kind of learning may stand in the way of learning at one of the other levels. For instance, a teacher may wish to teach high school students to look objectively at the facts about the influence of tobacco upon health and then to act upon what they have learned; but the students may learn to give a parrot-like response about the evils of tobacco and simply repeat this response, thus staying away from the levels of attitude and physical action. They may have learned that the "correct" verbal formula is enough to pass the course and therefore be satisfied with that form of learning.

All education of adults is aimed at changing behavior at the level of will or appreciation, or at the level of physical action. There seem to be certain characteristics of a learning process that change behavior at one or the other of these levels. These are that:

1. The learner (a) wants to change his behavior; and (b) understands that the learning situation will help him change his behavior.

2. The learning process (a) rewards the learner for each step toward success in learning; (b) is clearly related in the learner's mind at every step to the final goal.

This is more than is necessary, but the most effective learning seems to take place under these circumstances. The single most effective element is probably the one concerned with closeness of reward to the steps to be learned. Thus a pigeon can be taught to perform rather complicated tasks in choosing between openings where food may be hidden if it is rewarded by a piece of food for every step toward the final solution; and none of the other three conditions just stated is present for the pigeon.

This principle of immediate reward for very small steps toward the correct response is used in some of the teaching

or learning machines that have come into use recently. This has two advantages. It rewards the learner for making progress and it also tells him that he is making progress.

Some Examples

Some examples of adults learning will help to throw light on the learning process.

A 55-year-old widow takes a Great Books Course. What is the change of behavior which she wants? Perhaps she wants to escape from the lonely evenings she has been spending since the death of her husband. She wants to make new friends and find new interests in life. She understands that the Great Books Course will put her in touch with people and give her a chance to make friends. She remembers that she enjoyed studying as a college student and consequently she is pretty sure that the course itself will be pleasant, and much more so if through it she can find a new set of friends and a new way of spending some of her evenings. Thus the conditions for learning that should exist in the learner are met.

As for the learning process—the actual conduct of the Great Books Course and her experience in it—things may be as follows. She reads the books and enjoys them; takes enjoyable part in the discussion; makes several friends in the group. These are all rewards and they tend to keep her in the learning situation. She sees that things are going the way she had hoped. If, on the contrary, the class leader lectures all the time, allowing very little time for discussion, and if the discussion time is monopolized by a couple of vociferous class members, and if the other members of the class are all of a different age than she, then the rewards will be sparse, and she may drop the course.

A 60-year-old professional man takes a course in citriculture at a school of agriculture. He wants to learn to cultivate an orange grove which he intends to buy as a place to live and work after he retires. He knows he has the money to buy the orange grove. He knows that others are making a modest living in this way. Thus the conditions are favorable to his learning effectively.

In this case the learning process may go on without very strong immediate rewards. All the man needs is some encouragement from his instructors, in the form of good grades, and from his wife if he begins to doubt the wisdom of moving to the new place and the new house where the orange grove is located. He understands clearly the relation between what he is learning in the university course and his goal. To keep the goal vivid in his mind he may visit the orange country occasionally, looking for the place he will eventually buy.

A 45-year-old business man decides to quit smoking cigarettes. He wants to quit smoking because his doctor advises it, and he has been reading about lung cancer. In this case he does not take lessons. He may adopt various devices, such as keeping a bar of candy nearby, and eating candy when he gets the urge to smoke; or keeping a package of cigarettes in his pocket and telling himself that he will smoke a cigarette just before dinner, but not now. He believes that these devices will help him break the habit.

The learning process is full of punishment for him, because he frequently craves a smoke and suffers when he does not take one. But the candy supplies some reward. Also his wife and his children may reward him by compliments on his success in breaking the habit, on his will power, and so forth. Gradually he breaks himself of the habit, recognizing that his craving for cigarettes is decreasing, that his dreams or his fantasies are not so much concerned with smoking; and thus becoming aware that he is making progress.

In this case the man's motivation—his desire to quit smoking—is extremely important. He must teach himself to give up the habit, and he cannot get much help from others. He cannot succeed unless he has strong motivation.

This indicates the importance of learn-

ing at the level of will or intention. A person learns many of his motives. The process of motivation, or of acquiring motives is not the same as the process of learning to change one's physical behavior.

Previous Learning and the Learning Process

Adults generally have a repertory of behavior which must be changed when they learn new kinds of behavior. This complicates the process, because it requires unlearning. For example, consider the learning of the art of toothbrushing. When this is taught to seven-year-olds, it is new to them, and it comes at a time when they are easily motivated by teachers and parents to do what the elders think is good for them. They learn rapidly enough, especially if the art is well demonstrated and they are rewarded by approval of teachers and parents as they learn.

Once this art is learned, whether it is learned properly or not, this learning stands in the way of learning a new method. The person already has toothbrushing in his repertory of behavior, and if he is to change his method, he must unlearn the old and learn the new. Unless he has strong motivation to change his way of toothbrushing, he is not likely to change.

Motivation and the Learning Process

The existence of strong motivation to learn a thing makes the learning relatively easy and efficient. But sometimes there are severe obstacles to learning, despite the strong motivation, for example: learning a new language; overcoming the smoking habit; overcoming alcoholism; improving one's spelling ability. Here success is apt to require a long, hard effort. The learning process is blocked either by a set of bad habits which gives the person short-run rewards or by the difficulty of learning the new process, such as a foreign language. Success in this kind of learning venture depends on:

1. Strong motivation which drives the person on in spite of minimal immediate rewards and sometimes in spite of immediate suffering, as in abstaining from drinking or smoking.

2. A system of rewards for small gains in learning. For instance, the language teacher may encourage the learner by complimenting him, or by giving him easy and interesting exercises which give him a sense of success; or the alcoholic may join Alcoholics Anonymous and receive the rewards of continuous acts of friendship from his fellow members, of pleasant social evenings with coffee and refreshments to take the place of liquor.

When the motivation is weak the learning process is likely to be a failure unless the motivation is reinforced. For example, motivation may be weak in:

A program to teach people to follow a weight control diet after age 50;

A program to teach people to add a certain element to their diet—a vitamin, or a mineral;

A program to teach people to use a tooth paste with a certain compound in it.

In cases like these, the potential learner is not very uncomfortable at present; he knows it would be good to change his behavior, but he has weak motivation. There may be some punishment in the first steps of the learning process—as in the case of a diet program. Also the potential learner may not be very sure that the projected learning will better him.

The problem is to strengthen motivation. This may be done by:

Making the new learning popular; getting high status persons to set an example by joining the class or by adding the dietary element or by using the new tooth paste; or by getting a group of people to go into the project together, and to support and re-enforce one another.

Dramatizing the value of the new learning;

using movies, plays, and the like to convince the potential learner that he will benefit from learning or suffer from not learning.

Helping the potential learner to see himself clearly, with his needs and his shortcomings, and to resolve to enter into the new learning process, even if it is unpleasant for a time.

Thus the learning of motives comes to be a crucial part of any venture aimed to improve the health and well-being of people who are (a) already tolerably healthy and well off, so that they are not motivated by suffering to learn new things. Perhaps it was easier in 1900 to teach parents how to care properly for a baby's diet, because they had such vivid experiences of babies dying which motivated them to learn better ways. Nowadays babies are relatively healthy and, therefore, parents are less motivated to learn how to give them better care. On the other hand, motivation may be a problem when people are (b) quite badly off, but getting certain immediate satisfactions which they would have to lose if they were to learn the new and better ways of living.

In public health work in a modern society, changing people's motives is the main problem. Stating it in another way, there is often a conflict of motives, and the problem is to strengthen one motive and weaken another. For example, the problem in learning to diet is to strengthen the motive to diet and to weaken the motive to overeat.

Is There a Human Drive to Learn?

It sometimes seems that the human animal has an innate drive or need to learn that protects him from slothfulness and keeps him looking for better ways of living. This seems especially true of children, as they eagerly explore their world and take its measure with their minds.

Some students of human nature believe they find in human nature a drive to expand one's interests and activities through childhood, adolescence, young adulthood, and middle age, if not into old age. They believe that this drive is often blocked, but that it can sometimes be uncovered and set free again, even in adults who have not shown it for years.

If this is true, it is an important aid to adult learning, for it provides a kind of basic drive or motivation which can be channeled into certain areas—areas of work, family life, self-development, friendship, and civic activity. This means that a person may enjoy a new kind of music, a new kind of food, making a new friend, a new way of doing his work, or a new kind of family activity, just because it is new. After he has tried out the new experience he may keep it or throw it away, depending on its value for him. But he is open to novelty and therefore to improvement.

For anyone whose job is to try to teach adults to change their behavior it is useful and perhaps essential to believe in the existence of this human drive to learn. Then the task is to give this basic drive direction, or to bring it back to life and allow it to gain strength, so that it eventually will make the person into a learner again.

The human being is an animal who learns and seeks to learn all or nearly all of his life. In this proposition lies the chance of making something good out of the human venture.

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This paper was presented before a Joint Session of the Dental Health, Health Officers, Mental Health, Occupational Health, Public Health Education, and Public Health Nursing Sections of the American Public Health Association at the Eighty-Seventh Annual Meeting in Atlantic City, N. J., October 22, 1959.

Some key points on the psychological foundations of human behavior are succinctly and clearly presented. The author lucidly summarizes a large mass of material and indicates its relevance for public health.

PSYCHOLOGICAL BASIS OF HUMAN BEHAVIOR

Andie L. Knutson, Ph.D., F.A.P.H.A.

LAWRENCE K. FRANK, in an excellent discussion of "Society as the Patient," observed, "The individual, except when uniquely endowed, cannot escape from his culture and the peculiar climate of opinion of his age; he is immersed in it, like the fish in water, and is unaware of the surrounding medium."[1]

I am myself deeply immersed in the scientific and philosophical waters of my profession. In selecting some research and theoretical highlights regarding the psychological basis of man's behavior I have tried to escape from these professional waters in order to be critically objective. There seemed to be two alternatives: to take a small segment of the topic and dig deeply into it, drawing attention to critical laboratory and field research studies; or to use a coarse screen and sift a mass of evidence for a few key points. I have chosen the latter course.

A student once observed at the end of a course that the one thing he had learned is that everything is related to everything. What stands out in my mind at the moment is that everything is indeed related to everything. I hope to impart this feeling regarding the intimate transaction of inner and outer forces, physical and social, that fuse to lead man to behave as he does.

Man Is a Social Animal

Man is a social animal. His slow development in a sociocultural setting enables him to learn language and technical skills that have required untold centuries to develop. Without a society to give him the products of culture, man as we know him could not exist. A major part of man's life is concerned with social interaction. He is born with a greater capacity than any other animal for sharing the communications of others through the use of symbols. By using symbols to represent things, and the relations between things, he is able to transmit ideas to others whether they are present or not, and about things that may not, in fact, even exist.

Perhaps man's greatest quality is his capacity for creating and giving symbolic meanings and values to intangible and abstract things. By making use of this capacity, he is able to extend himself so that he can participate in groups far removed in time and space, and share with others his thoughts, his beliefs, his hopes, his fears, his concerns, his expectations and intentions.

So intricately is man enmeshed in a sociocultural setting, that it is meaningless to speak of man's psychological behavior apart from this setting.

For the purpose of illustration, let us think of an artichoke as representing man in and part of his many social groups. Consider the core of the artichoke as representing his core personality. We need not infer that this core is completely innate for even the single cell requires nurture; the chemical nature of this nurture and the manner in which it is presented to the cell influences the pattern and manner of cell development.

The first circle surrounding the core might represent the prenatal environment; the second, the members of his immediate family; next, peer groups environment; and in order, social and church groups, social class, ethnic groups, and finally broad religious and nationality groups.

Thinking of personality in this way we may say that it is necessary to peel off the concentric circles, the overlapping layers of the artichoke in order to understand the influences more directly applied to the core. It is not easy to understand the ethnic and caste groups, for example, until the effects of the over-all religious and nationality group have been removed. Likewise, understanding social class requires a removal of the ethnic and caste groups, for social class exists within both and yet may be overridden by the impact of caste or ethnic group in its significance for the individual.

It should not be implied for a moment, however, that these group influences are independent of one another. Man distinguishes himself from other animals in part by his ability both to absorb and influence the milieu in which he grows. There seems to be no completely stable boundary between man and his environment at any point, physical or social.

Nationality, religion, caste, class and the other social variables described are man-made and may be man-changed, but in so far as they exist and as long as they exist they directly affect the health status of individuals who share them. To consider the health status of any individual or group, to consider means of influencing that health status, or even to consider the definition of health status within such groups—requires an understanding of these broader sociocultural variables. We must, therefore, look at our concentric circles around the core personality of the individual as overlapping and permeable circles through which influences pass both ways. For just as the individual influences the broad cultural climate in which he lives, his physical, emotional, and psychological health is directly or indirectly influenced by that climate.

Sociocultural influences on health status are many and varied. The Indian mother who insists that the newly severed umbilical cord of the infant be wrapped in cow dung, or dares not boil the sacred water of the Ganges lest some ancestral life be threatened is led through cultural pressures, unrecognized, to threaten the very life of her infant. Yet her behavior is no less consistent with the values of her culture than that of the midwestern farmer who takes pride in the health of his children and rejects the idea of their going for regular physical examinations or x-rays. To do so suggests weakness in the family. Such behavior is not in accord with his measure of health as expressed by his boast, "We come from good stock. I have never been to a doctor in my life."

One can but wonder to what extent health status is influenced by the value we in this country place on speed, on activity, on verbal abilities, on competition, on romantic love, on conformity, on personal wealth, on time—values which are by no means common to all men.

It is not necessary to illustrate the way in which each of these broad socio-

cultural variables surrounding the individual influences health status in order to recognize that all play a part in making him the unique individual he is. To understand him as an individual one must unclothe him gradually from the social forces in which he is encased and seek to understand as best we can by such research means available the nature of the impact of each of these forces. Yet by the very process of attempting to remove these social forces for purposes of analysis, we are removing parts of man himself.

Man as Part of Environment

Man is at once both part and product of environment. We cannot safely speak of man and environment nor of man interacting with environment. Dewey and Bentley[2] suggest that the relationship is one of transaction rather than interaction. Any change in either man or environment, of which he is a part, is ipso facto a change in the other.

The skin that binds the flesh confines neither psyche nor soma. Man's self or ego—the center of his psychological activities—knows no boundaries. It may become extended through identification with persons, places, or things far removed in time and space. The things with which man identifies may be real or imagined, tangible or intangible, nearby or infinitely removed. Yet whatever affects the object of man's identification affects man himself, for psychologically his identifications are part of himself.

This applies whether the object of man's identification or loyalty is a friend or leader, a country or city, an idea or principle, or some social or religious value. It may be a symbol out of the distant past that retains personal significance for him. Even the self image with which man identifies may bear only the slightest relation to this physical self. The intangible scars left by the surgeon who removes a tumerous breast may have far greater significance to the patient than the scars left by his knife.

To say that man is at once both part and product of environment is to say that we cannot expect to take man from his environment, change him through treatment or therapy, return him to an unchanged environment and expect him to function effectively. Personal and social difficulties are almost certain to arise. A rehabilitated heart patient, for example, may have difficulties learning and carrying out new occupational and family roles when those about him have learned to expect another pattern of action from him. Role expectations must change if new role enactments are to be successful. The mentally ill patient who has been reclaimed by society and returned to an unchanged locale is almost certain to become a recidivist. Social forces that contributed to his first illness are likely to be still present and active.

Nor can one expect to change an environment as in a slum clearance or urban renewal project without having an impact on the economic, social and emotional lives of the families involved. The family lifted from slum life into modern low cost housing may suffer greatly from the loss of intimate ties fostered by overcrowding and shared misfortunes.

Technical and industrial progress may seriously disrupt the social and economic structure of a community. Families are deeply injured by rapid changes in occupational status and by the realignments of social and economic forces that accompany what we call progress.

Dorolle has aptly observed, "When we set about improving a people's health, we must put aside our own concepts of good and evil, better and worse, and not encroach on the people's beliefs and cultural concepts. Everyone has the right to develop his own philosophy and to refute any change in it which does not come from within himself; furthermore,

it is useless to attempt to impose changes and cultural concepts from the outside. If such changes are imposed, they cause disequilibrium and misunderstanding which seriously compromise the work which is being attempted."[3]

The Unity of Man

Another characteristic to which I invite attention is concerned with the unity of man. Man's behavior tends to be holistic or molar rather than segmental or molecular. We may dissect him into various physiological, psychological or social parts for purposes of analysis or description, but we must not be led astray by this type of analysis. His behavior seldom, if ever, reflects clear distinctions between purposes, cognitions, emotions, and reactions.

Sensory and cognitive processes combine in a marvelous perceptual harmony to yield man a unified sense of environment. Memory traces, refined and reorganized through thought and imagination, enter into his every perception. Motives, derived through experience, are ever present and functioning to influence the selection of things to perceive, to remember, to recall, and to act upon. Expectations regarding future actions evolve out of his evaluations without any conscious awareness on his part.

Even conflicts within the individual, resulting from the interplay of conscious and subconscious factors, may be resolved without his awareness. Slips of the tongue or pen sometimes reveal inner conflicts to the outside world, yet the behavior may remain consistent from the standpoint of the acting individual.

Man's behavior in sickness, as well as health, is holistic. When he is sick in part, he is sick all over. A minor itch gains his full attention by intruding itself in spite of the best efforts to ignore it. Temporary discord in one area of behavior tends to disrupt responses in another. A toothache may be generalized to far reaches of the body. The emotional or social aspects of tuberculosis, cancer or diabetes, for example, may be of such overriding significance for the individual that he is unable to follow a prescribed course of treatment. The interplay of cause and effect in stuttering may lead to withdrawal and social isolation or, conversely, to marked aggressive reactions.

Many of the ills of modern society stem from attempts to deal with man segmentally rather than with man as a unit. Specialization, which seems to be an inevitable outgrowth of scientific advance, results in institutions competing with one another for primary segments of an otherwise unified man. How far removed we are from the medicine man, who for all his weaknesses, sought to treat the total man! He had strengths which have not been duplicated in our modern society.

Within the near future we can anticipate some form of national program of medical care of the aged. I sympathize deeply with the persons responsible for conducting such a program locally. For how can one possibly distinguish between the physical and emotional health needs of an aged person? How can one deal successfully with his health needs without being concerned with his housing, his economic status, his means of communication, his social outlets, and his needs for achievement?

If we look at the other end of the age continuum we find evidences that the child is being pulled apart in his social and emotional development by competing institutions, each one seeking to capture a particular segment of the whole. One institution tries to teach him to share and help others; another, that private enterprise must be competitive; one appeals to social morals and others appeal to his needs for social entertainment. Educational TV competes with corrupt quiz programs and payola; civics courses compete with headlines about dirty football or police brutality.

Is it any wonder that children are learning a Golden Rule distorted in practice to mean, "Do unto others as they might do unto you, but do it first."

Uniqueness of Man

The total man of whom I speak is a unique man. He is born into society with his own peculiar pattern of biologically determined capacities, abilities, and characteristics which make him from birth different from any other human being. As he grows and develops in his own unique way in his own special world he learns through experience particular ways of thinking and acting. These serve him in applying the resources he has to take advantage of opportunities to satisfy personal needs or wants, or to cope with the problems he faces.

As the individual grows he acquires a sense of belongingness or personal identification with many specific groups within his surroundings. From their norms and values, he knits his own norms and values; their interests and wants color his own interests and wants; he may adopt their purposes and goals as his own. Yet, throughout, he remains a unique individual wanting, hoping, striving for, expecting—and perhaps fearing—things different from anyone else. How he acts to apply his own pattern of capacities and talents to achieve his ends is also different in some ways from any other member of his special pattern of groups.

A person's health is one of the most intimate aspects of his personality. So intimate is it that he may have difficulty communicating with anyone, even himself, about it.

In dealing with the chronic illnesses, even more than dealing with the earlier problems of public health, the active participation of an individual is required in case finding, diagnosis, treatment, and rehabilitation. Persons working in such programs, therefore, need to be particularly sensitive to unique differences among individuals. One individual may have had unusual experiences that cause him to be afraid to acknowledge or report symptoms; another may have learned to distrust the methods of diagnosis used or the treatment offered; another may doubt the likelihood of successful treatment. Persons like this may place greater value in their own feelings than in the x-ray or other scientific methods of diagnosis, or may have learned to distrust professional persons who use scientific method. How difficult it is for many of us to realize that slow physiological changes in our own bodies take place without our being aware of them until they are ultimately reflected in malfunction.

If the groups to which a person belongs attach shame or weakness to certain health conditions he may not be able to acknowledge even to himself that he has such a condition. Social barriers are often more effective motivators than physical forces. Strong resistance to outside influence suggests deep personal motivation.

Social Behavior Is Learned

Man's social behavior is acquired or learned behavior. His motives, perceptions, cognitions, affections, and emotions in so far as they are related to specific things in the world about him are learned rather than innate aspects of his life.

The wide range of interests, concerns, and wants that we call human, and the intricate means man has for attaining satisfaction or for coping with difficulties are not present at birth. They cannot be passed along from generation to generation through the germ cells. They must be learned anew by each infant through the slow, tedious but remarkably efficient process known as socialization.

The infant born with a unique physical and glandular structure has the potentiality for a wide range of energy output. The orchestration of the varied potentials—the matrix of personal and social motives, the modes of coping with challenges or misfortunes, the details of personality style—all these things which comprise the richness of human life grow out of the experiences of socialization.

A wealth of research evidence suggests that our perceptions and cognitions as well as our social motives are learned during the socialization process. We learn to perceive as we do. The organized field which each of us identifies as his world is constructed through a slow, arduous process of learning. This individual world, or private world, may be a happy or a sad one, easy or difficult, challenging or frightening. But whatever it is to each of us individually, it is in good part so because we have learned through experience to make it so.

Present knowledge concerning the role of heredity and environment in human development leads to an unequivocal rejection of instinct explanations for social motivation, social beliefs, social attitudes, or social behaviors. The child is not born with a set of values, nor with a pattern of goals, nor with a set of rules of human conduct, nor with a sense of love, affection, or trust for other human beings. These are man-made things that are imparted to him in early childhood.

Children learn to be clean or to be dirty, to be active or sloven, to be cooperative or competitive, to be submissive or aggressive, to be tender or cruel. They learn to love and to hate, to share and to steal, to run or to fight. Their health behaviors, no less than other behaviors, are acquired.

How strange it is that even among the scientists who most strongly question the instinct theory and would deplore its use in explaining the complexity of adult life are some who still tend to react toward man as primarily a biological rather than a social being and tend to treat him and to study him without reference to the social world which has helped to shape him and of which he is an integral part.

In this modern age, man no longer needs to accept culture as a blind and inevitable force, nor need he accept the socialization process as an unchanging mechanism for maintaining the ills as well as the gains of our culture.

If we are concerned with positive mental health, then ought we not be concerned with evidence that suggests that environment influences a child's potential to perceive and to discriminate, his potential for acquiring and using language necessary for coping effectively in his social relations, his potential for becoming a secure, exploring child with a healthy orientation to the world. These things can be learned, if we but knew how to teach them.

Man's Behavior Is Motivated

Man is a purposive animal. His life is a constant struggle to satisfy wants, concerns, desires, hopes, and aspirations and to avoid, minimize or escape pain, discomfort or injury. His day-to-day behavior is ruled by needs and purposes of which he may be unaware as well as by his conscious decisions and intentions.

Since individuals are unaware of all the dynamic factors influencing their reactions, motives cannot be studied directly. They must be inferred from observations concerning behavior, including of course verbal response. The relationship between motive and response patterns is an intricate one, far less sharply defined than might seem apparent. Motives are slithery things and creep into our lives in ways we can neither always anticipate nor always identify.

Freud called attention to the hidden

needs and wishes that govern the remembering and forgetting of things and to the motives that lie behind our slips of the tongue, slips of the pen, misreadings, faux pas, and other errors of commission and omission. Sometimes we may be willing to admit there is purpose in error. Often, however, the motives are so intimate or unflattering that we cannot admit them even to ourselves. In fact, we may not even notice the slip made in expression or gesture. Is it surprising, therefore, that others can sometimes recognize and interpret these errors more accurately than we can ourselves?

The precept that man is a motivated animal and that all his behavior is motivated behavior has many implications for those concerned with education for change in individual or group health behavior.

Broadly speaking, in order for an individual to learn new ways he must experience some uncertainty, frustration, or concern, or have some curiosity perhaps, which leads him to distrust his present facts, perceptions, values and assumptions and which orients him toward an interest in new ideas. Motives govern this process, for learning new things requires unlearning old things which serve personal needs. Thus the process of learning is a period of seeking, of exploring, of groping, of discursive activity, of shaping new questions, of challenging old facts.

External events may stimulate uncertainty, frustration, or curiosity, but motivation for dealing with these cannot be imparted from without. It must develop from internal tensions. As Whitehead,[4] in the "Aims of Education," observed, "education must be essentially a setting in order of a ferment already stirring in the mind: you cannot educate in vacuo."

When we speak of motives and motivation we need to be cognizant of the fact that patterns of motives are specific to the individual. Each person acquires his own pattern of motives, concerns, hopes, fears, aspirations, expectancies. Only when we have common patterns of experience do we develop common patterns of motivation.

There is some evidence that a person's patterns of striving relate to his economic, educational and occupational status—what might be called his station in life.[5] Maslow[6] suggests that human motives can be ordered into a hierarchy from those directly tied to physiological need on the one hand, to others which relate to an individual's need for self-actualization or creative development. Individual variation exists, yet a general separation of human needs into such a hierarchy pattern seems possible.

A person who is starving, thirsty, freezing, or suffering from other physiological discomfort finds his whole attention consumed by these basic demands. As these demands are satisfied, he becomes more concerned with his safety, comfort from heat and cold, job security, protection against disability or illness, and the like. He then becomes concerned about developing affectionate relations with other persons, with acceptance and love of his fellow men and belonging to their groups. Once his physical and safety needs are satisfied at some minimum level, and his love needs and needs to belong are met, he becomes concerned about self-esteem, prestige, status, recognition, attention, and power. Satisfaction of these needs gives him self-confidence, a sense of worth and adequacy, and his concern shifts to matters of self-actualization and creativity. Each of us can think of many exceptions to this general pattern Maslow describes, yet in a general way his theory does seem to hold.

It may be helpful to look at the public reactions to what public health has to offer in terms of this pattern or hierarchy of needs described by Maslow. Are our programs centered in areas in which

people have high concern? Are we adapting as quickly as we might to emerging concerns of those we serve? Is it possible that we may be attempting to guide people to be concerned about what we believe to be important? Might we be more successful if we tried to find out what they considered high in importance within their need hierarchies?

Man's Private World

A quarter of a century ago F. C. Bartlett, in a classical study entitled "Remembering," called attention to the tendency of the mind to reshape and organize all experience in a way that is useful and meaningful to the individual. His central theme was, "It is fitting to speak of every human cognitive reaction—perceiving, imagining, thinking, and reasoning—as an effort after meaning."[7]

What man perceives in this search for meaning tends to be influenced by personal interests, wants, concerns, anxieties, fears, hopes, and expectations—a network of conscious and subconscious motivating forces. As Cantril has suggested, "the assumptions we bring from past experiences . . . are involved in every perception we have."[8]

Our perceptions are our sole means for maintaining an awareness of ourselves and other things. They serve us in filtering out things of immediate importance to us, and bringing them into meaningful focus. What seems unimportant or unchanged tends to be ignored. In some strange but marvelous way each perception melds with memory traces to give us a sense of continuity in experience.

During any specific moment of life our sense organs are bombarded by a wide array of light waves, sound waves, pressures, heat and cold waves called stimuli. It would be physically and mentally impossible for any of us to be consciously aware of every one of these light and sound waves, much less pay attention to them and react accordingly. Fortunately, we learn to organize these masses of stimuli into meaningful wholes that make sense to us and have meaning for us—wholes that help us to decide how to act. For the primary purpose of perception is to guide us in our action.

Through our perceptions we maintain a sense of stability in an ever-changing physical and social world; clues reaching us from many channels yield a sense of assurance that what we have just seen and felt will remain to be seen and felt again. We are certain the landscape is continuous even though we may never be able to perceive all of it at once. We are confident of a yesterday and of a tomorrow although we can only experience time directly second by second.

We gain a sense of stability or constancy with respect to other persons and things as well as time and space. We learn to identify a friend whether he is nearby and creates a large image on the retina, or so far away that the size of the image is minute. We recognize him in bright light or in shadow, from front or side, standing or sitting, moving or sprawled. We know him by the sound of his voice, or by the presence of some familiar mannerism such as a cough or a sniffle. In some miraculous way we resolve gross discrepancies from among different images received and perceive our friend as we assume or expect him to be, yet are never conscious of the intricate processes involved.

Words, too, are perceptions. Spoken words are organized groups of sound waves to which we give meaning; written words are organized groups of light waves to which we give meaning. Early in life we learn to give meanings to these groups of sound and light waves, so that we can use them in acting more effectively in daily living.

Rather than perceiving many worlds of different kinds, appearing and disappearing second by second in hap-

hazard fashion, each of us learns to perceive one world with himself as center. Each of us is the center of his own world through which all things of significance move and transact. It is a private world in which all his experience is fused.

This world which each of us creates through his perceptions is different from anyone else's private world. In fact, he can only share it with others through communication to the extent that their experiences are similar, so their private worlds overlap with his own.

The private or assumptive world of which I speak is not the world of fantasy or imagination, nor is it a lovely retreat from reality; rather, it is for each of us an essential map or chart whereby we can evaluate possible future activities against past experience and obtain guidelines for future action.

This concept of a private world helps us to understand why we so frequently have difficulties in communicating with other persons. It helps us to understand why each of us has a tendency to see and interpret any situation in the light of his own pattern of experiences and motivations regardless of the means whereby the information is received. It helps to understand the growing evidence that new knowledge alone is not likely to be effective in changing beliefs and actions, but that after some changes in belief have occurred or new values have been acquired the individual is likely to seek information that will help him to support the new beliefs or values he has acquired.

We have here the theoretical basis for self surveys, pretesting, progress evaluations and staff planning as means of improving programs. By these means opportunities can be provided for people to offer a "feed-back" in terms of the way they perceive specific aspects of the program. This is one means of applying with groups the same technic we use in our interpersonal communications.

We speak to an individual, watch his expression, notice whether he smiles or frowns, wait for his interpretations, seek guidelines which will tell us whether we are moving in the right direction or not. If he frowns or in some way indicates he has not agreed, we change our tones, use other arguments, give and take with him until we find a point of agreement. If his interpretation suggests that he does not understand, we change our words, try to find out how he interprets the problem, and use his terms as a bridge to better communication. This is the process whereby we gain entrance into his private world, his world of assumption. This is the means whereby he, and we, are able to gain an overlapping of our private worlds in the area of mutual significance.

Summary

Man is a social animal, so intricately enmeshed in his sociocultural setting that it is meaningless to speak of his psychological behavior apart from this setting. Although we may dissect man into his various physical, physiological, social and psychological parts, his behavior in sickness and in health tends to be the total behavior of a unified social organism. By birth and particular experience, this unified man is a unique man, different from anyone else in his capacities, abilities, patterns of motive, and patterns of action.

Man's perceptions and cognitions, social and personal motives, his modes of coping with environment, the details of his personality style—all these things which comprise the richness of human life are learned through the process of socialization. He is a purposive animal whose day-to-day behavior is ruled by needs and purposes of which he may be unaware, as well as by his conscious decisions and intentions.

He seeks meaning from experience and in the process learns to perceive one world with himself as center, a private

world in which all experience is fused.

This private world which he creates through his perceptions serves him as an essential map or chart whereby he can evaluate future activities against past experience, and obtain guidelines for future action.

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A Moving Population Writes the Ticket

"For the First Time" is the title of the biennial report, 1959-1960, of the Jefferson County Department of Health, Birmingham, Ala. The completion of the title sentence on the inside cover reads: ". . . in the history of . . . Jefferson County all 31 municipalities made an appropriation for public health." How this was achieved is suggested rather than spelled out in the text. It was in part due, no doubt, to "The continuous movement of the population from the large municipalities to the fringe areas (which) has materially increased these (environmental) problems. . . . The people are demanding that improvements be made. . . ." However, the jobs that still need to be done are spelled out. They include problems in indigent care, air pollution, housing, and fluoridation. The JCDH, headed by George A. Denison, M.D., may have extra copies of its report. It is located at 1912 Eighth Ave. S., Birmingham.

What determines the concerns of a community about the health of its members? How are such concerns handled? A study of a community in the Great Plains area suggests some answers, and the author indicates possible application of the findings in this study.

SOCIAL DETERMINANTS OF HEALTH PRACTICES

Gordon Macgregor, Ph.D.

THE PUBLIC HEALTH SERVICE in 1957 initiated a broad research study on local public health practice. The purpose was to evaluate current health problems and the ways in which communities might meet them. The hope was to find improved means of providing public health services.[1]

This project began in the Great Plains region, selected because approximately three-fourths of its counties had no full-time organized public health services and little was known of the region's health problems. We were frankly curious as to why local public health services had not expanded in this area. We were also interested in evolving an interdisciplinary methodology for evaluating the status of a community's health and its ways of maintaining it.

On the basis of available census data, one county was selected as representative and appropriate for initiating the study. The research undertook three areas of investigation:

1. Evaluation of the current health status through a questionnaire and statistical analysis;
2. Study of the subjective concerns about health through a social psychological technic; and
3. Inquiry into the ways of handling health problems and services through an anthropological community study.

This report is based on the third area of investigation. It summarizes the study results and presents hypotheses about health behavior as guides to planning for local public health services.

Briefly, the social determinants are related to (1) the health behavior of the individual; (2) community organizations and procedures for meeting group health problems; and (3) the social structure for planning and providing community medical care.

The research method may be described as a cultural or ethnographic study of one town and its surrounding countryside to learn the way of life of the people, and the relationships and interactions among different social groups. Because the public health services and medical care came from outside the community, it was also necessary to look at health activities of the county and state as they impinged upon the community. Although this method describes characteristics for only one community, comparison with the results of other studies on Great Plains population groups indicates our observations have a wider applicability. The cultural adaptation and change of a Kansas farming community in the Plains en-

vironment, analyzed by Bell in the 1930's, show many comparable characteristics.[2] Miller describes a similar pattern of local leadership and the role of county government in another western community.[3]

Individual Behavior

Our first observation concerns the Plains environment and the cultural values that have influenced the behavior of the people and, additionally, their attitudes toward illness and use of medical care.

Because the cyclical nature of rainfall in this semiarid environment creates high risks in farming, people have had to devote most of their energies to making a living.[4] To survive, the homesteader and his family since pioneer times have had to rely essentially upon themselves. Such circumstances have accentuated American personal characteristics of independence, self-reliance, and endurance. These cultural values, plus the necessity to keep up with farm work to make a living, have become strong pressures to consider carefully before deciding whether any family member shall take action or use time unrelated to farm responsibilities. When faced with illness not seen as immediately threatening to life or the capacity to work, these people will often decide to postpone medical treatment.

When informally interviewing persons about how they handled illness and other personal problems, we found that many characteristically deyaled or wrestled with such problems for a long time.[5] When the need to act became obvious, a family member or a friend took action. Problems of emotional or mental stress were brought to persons we call the "gatekeepers"—ministers and welfare and health workers—for help in reaching a decision to see a physician or go to a hospital. Probably fear of the doctor or his diagnosis and of the cost of medical care were also determinants—but their degree of significance was remarkably less than expected. This behavior was also found to some extent among townspeople, most of whom had been raised or had worked on a farm.

The pattern seems to be inculcated in the local culture. Talcott Parsons, the sociologist who has made the most penetrating studies of American social behavior related to illness, advances the theory that health and illness, in addition to being physical realities, are socially defined and the behavior of the sick individual which follows is expected to conform to social definitions.[6] In the process of growing up, a person learns his community's definitions of health and illness and the behavior appropriate to illness.

When a person becomes seriously sick, he goes to bed and he or his family is expected to call a doctor. His discomfort drives him to try to get well. These actions, we say, are common sense. They appear to us to follow naturally from the way we feel and the symptoms we observe, because we belong to one culture. But the sequence of acts taken by the sick person is also dictated by his culture. American society defines health as the state of optimum capacity to perform our daily tasks and the social roles we have assumed or have had assigned to us. Conversely, our society defines illness as a disturbance of the capacity to perform tasks and social obligations.

When through some disease or impairment in our physical condition we exhibit deviance in our usual behavior —by stopping work, failing to carry out our expected roles in the family and community, and taking to our beds —the community exempts us from our responsibilities. Although the condition may be accepted as legitimate, the community also requires its validation. Families or friends first pass on the fact

and seriousness of the illness and often make the decision to seek medical care. The purpose may be to get expert confirmation that illness exists, as much as to determine the nature and seriousness of the illness. When the status is established that help is needed and should be accepted, the bridge is created for introducing a doctor or other healer. Having learned in his social training the expectations of society of one's response to illness which provokes a sense of anxiety or guilt about being or remaining ill, the individual is highly motivated to become well.

In summary, learned psychological and social forces within the individuals and those brought to bear by their group move the ill to regain their health and capacity to assume their usual work and social roles. To these pressures the majority of society responds. This theory involves the concept that time is taken for personal decision and the referral to others in the family or to gatekeepers. This helps to explain the delay we have observed before an individual in our Plains community seeks medical care.

When discussing in our interviews the need for preventing illness and ways to do it, we also found the people commonly expressing several attitudes. The Plains is a healthy place in which to live, and concern about health is normally low. Health is seen as adequately maintained in the family diet and home sanitation. Folk beliefs about cause of illness and about self-medication are not extensive. However, illness is often conceived to be due to external causes, such as a fall in childhood or poor living habits.[7] These are accidental and moral factors that cannot be controlled by preventive medicine. Public health services provided by the county, state, or federal government (except for the county nurses' attention to school children and some families) are not seen as having any direct relation to the individual's welfare. Unless one's physical well-being or role is perceived as being directly and seriously threatened, precautionary health measures—for example, regular physical examinations or pasteurization of the family milk supply—are seen as unnecessary.[8]

The American cultural pattern dictating the behavior and the process by which individuals reach the doctor prevails in the Plains. Our hypothesis is that the vicissitudes of farm life encountered in the Plains environment have accentuated the usual causes of delay in turning to the physician. The patterns of health behavior in this community also imply a need for education and counseling promoting referral of persons with problems affecting health.

Unless encouragement of individuals to adopt preventive health measures is based upon the effect of illness in disrupting occupational and social roles, such encouragement will have little influence. This concept should be used in programs to educate people to accept precautionary measures against illness.

Community Behavior

This leads us to consider community behavior. The basic social community is the town where local people and those of the surrounding open country transact their business and enjoy their most frequent social relationships outside the family.[9] Each town is extremely important as the fundamental center through which to mobilize support and implement health or other social action programs. One of the most significant aspects of these communities is the number of organized social institutions and the variety of health activities carried on. These organizations assist the county nurse in screening school children for physical handicaps and transporting crippled children to district clinics; they bring in outsiders for health education lectures; and they raise funds for national health agencies.

Men of the community have had their blood types registered and care available as a blood bank group. A group of women has purchased crutches, hospital beds, and similar equipment to rent to families of the sick. Home demonstration clubs sponsored a county-wide public immunization program and organized it on a community basis as the customary and most feasible way of reaching the general public. This pattern is familar to all who were brought up or have worked in an American small town.

The towns as hubs of communities are well distributed across the middle of the county to meet the needs of the sparsely settled population living in a vast territory. But there is a definite handicap in having so many separate community groups handling health activities. Planning and provision of services in these communities are not uniform or integrated. The decrease of populations in the smaller towns is leading to a diminishing number of local services. The fragmented and changing community organization carrying on health activities reflects the problem, stressed by Kraenzel in "The Great Plains in Transition," of the social organization not being adapted to handling the social and economic problems of the region.[10]

The county is a more practical institution for organizing and administering public programs, but it does not function here as the fundamental planning unit of society. The county is a political community with artificially defined boundaries having a government unit and staff that provide public services through public funds. A health officer is appointed to maintain health standards and enforce health codes, and a part-time nurse is employed primarily to supervise the health of the school children. The county operates a hospital, but in effect this is a town health center serving the population of the eastern half of the county and its contiguous area. The hospital, furthermore, is staffed by physicians in the county seat.

The county is not a community in the sociological definition of the term, which connotes a geographical area with the residents bound together by common interests and greater social interaction among themselves than with people on the outside. The Plains people have a stronger social identification with their local town-open-country center.

Social Structure

Health programs of county-wide scope do not usually originate through the county. Such programs begin with committees of voluntary associations, clubs, or organizations of the town communities. After the problem to be met has been determined, the next step in the process is obtaining the approval of the county government if its legal authority or financial support is needed. The original committee brings together various commercial, professional, and social leaders and gains the cooperation and broad support of the social organizations of the community or county. The program is then carried out by private citizens as leaders. The acceptance of their program as a continuing county activity depends upon the county board of commissioners and its judgment of the extent of public demand. Otherwise once its task is completed, the committee disbands.

The building of the county hospital, the organization of the county-wide polio immunization program, and the appointment of the first county nurse were developed in this way. Observation of these activities indicates that four social groups are the initiators and decision makers: (1) the women's groups, which as in other American communities assume leadership in health, education, and welfare activities; (2) the men's associations and service clubs; (3) the county commissioners; and (4) the members of the medical profession.

The key group in this structure is that of the local physicians. They have come into the towns to establish private practice, but in these localities without organized professional public health services, the people expect physicians to give advice, to participate in community health activities, and to take action in health crises. As educated persons and social leaders interested in community affairs, the physicians willingly accept this responsibility. Thus, they enter the leadership structure that determines medical care policy for the community. This is not an unfamiliar role for physicians in the American social structure.

In brief, the policy and decision making for county-wide health programs rest with an informal social system or community-power structure, composed of several lay, official, and professional leadership groups. This structure moves in response to the concerns of leaders of one social group, reaching its decisions and obtaining full cooperation of gaining the approval of each other group. These groups are closely interrelated or interlocked by membership of the leaders in more than one group and by their close personal ties. The groups are also related according to the degree of power each possesses to stimulate or compel social action.

This pattern is not unique. Every community has its power structure.[11] In this Plains county the medical care power structure is the strongest element in determining health policy. But it is an element which leaders of voluntary associations and staff members of official health agencies often fail to appreciate, or they neglect it in proposing social action programs.

We have noted, in observing the action of groups of this structure, that some difficulty has been experienced because professional and lay groups have different perceptions of community health problems and opinions as to ways of meeting them.[12] Sources of disagreement arise from the interest or emphasis placed in the desire to protect the population quickly against epidemics, the clinical seriousness of threatening diseases, provisions of care through mass immunization or by individual treatment in physicians' offices, costs of medical care and burden of taxes, and town rivalries to be first or most benefited by health programs.

We also noted that the basic objectives of public health practice and knowledge drawn from professional public health experience are lacking in the policy-making process. The State Department of Health performs various roles in the county, such as consultant to voluntary associations, technical adviser to town councils and the county nurse, as well as provides legally required routine services. But no public health officer or worker serves regularly with the community or county groups in planning or in helping to resolve problems arising from different perceptions and conflicts of interests.

We have also observed that when the social structure produces an ad hoc organization whose members have only temporarily high concern or emotional involvement in overcoming a community health problem, its life cycle is short. The procedure does not develop a continuing means or service for preventing a repetition of the problem.

If these hypotheses on individual behavior related to illness, inadequacy of the social organization, and the community power structure—seen as social determinants of health practices—can be fully substantiated in Kit Carson County and other counties of the Great Plains, there is implied a need for a permanent, minimal organization to provide educational, planning, and administrative public health services. In the last analysis, the community must decide this on the basis of its health needs, resources, and available assist

ance from the outside. We see an integrated state-county rural public health organization—combining the efforts of a supervising health officer and technical staff at the state level with broadly trained public health workers at the county level—as a basis for developing new and continuing services in cooperation with local communities.

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This is the fourth of a series of reports of the Great Plains Health Study of Kit Carson County, Colo. Assistance to the study group of the Public Health Service was given by the Colorado State Department of Public Health, the Rural Health Committee of the Colorado State Medical Society, the Health Committee of the Great Plains Council, and the Farm Population and Rural Life Branch and Federal Extension Service of the U. S. Department of Agriculture.

By reviewing a number of studies of public health nutrition programs in rural areas in various parts of the world, the author has summarized a number of conclusions reached by social anthropologists. Furthermore, having worked in the field herself, Dr. Burgess adds her comments and indicates the significance of these conclusions.

NUTRITION EDUCATION IN PUBLIC HEALTH PROGRAMS—WHAT HAVE WE LEARNED?

Anne Burgess, M.B., Ch.B.

"The Froward Retention of Custom can be as Turbulent a Thing as an Innovation"—Francis Bacon

IN RECENT years increasing control over the communicable diseases has enabled the full extent of the problem of malnutrition and its effect on the public health, especially in the underdeveloped countries, to become more obvious (Burgess, 1956).

Wartime experience in Great Britain showed that general improvement of the health of the child population (as measured by sustained increases in the height and weight of schoolchildren) could be achieved when intensive education was accompanied by national measures to insure that the recommended foods were easily obtainable and within the purchasing power of all.

This lesson has since been widely applied, and programs for the improvement of nutrition have usually included some form of aid such as free milk, seeds, implements, and so forth, to complement the educational efforts. Nevertheless, the desired alteration in food habits and child-rearing practices do not seem to keep pace with other changes in the life of the community.

Public health workers, impatient at the slowness in achieving the necessary cooperation from people who apparently need and want to improve their standards of living, have sought the help of the anthropologist and the educationalist in order to bring about desirable changes more rapidly. This paper attempts to summarize the conclusions reached by social anthropologists who have studied programs intended to improve standards of nutritional health in some rural areas, and to describe some of the findings of the health education field worker.

The reports of these studies, while describing the ways in which different people think about food and health, also show the interrelatedness of all aspects of the life of a community and emphasize the difficulties and dangers of trying to change one isolated aspect of this whole complex. Where ways of improving the educational effort are suggested, these naturally vary in detail but have certain common features from which possible causes of the present slow progress can be deduced.

There are, apparently, two main essentials for the success of any educational venture: (1) an awareness, on the part of the educators, of the attitude and skills appropriate to their task, and (2) a detailed knowledge of the economic, social, and cultural conditions of the area in

which nutrition education is to be carried out.

In countries where the level of literacy is high, the native-born health or nutrition workers have the great advantage of thinking along more or less the same lines as the people they seek to educate. The local food prejudices are common to all, and the danger of advocating some unacceptable innovation (such as supplying extra protein to British children in the form of frogs and snails) hardly ever arises (Jelliffe, 1956).

The situation in the economically underdeveloped countries is, however, completely different. A wide gulf—economic, educational, and frequently cultural—separates the educated health workers from the illiterate peasants whose nutrition they wish to improve. No longer do the educators instinctively know what will be accepted without question, nor how their fellow countrymen think about health and the prevention of ill-health (Freedman, 1954; Foster, 1951; Mead, 1953).

Moreover, the majority are doctors, nurses, or public health workers trained in the theory and skills of public health or nutrition, but with little or no training in the principles and technics of education (Griffiths, 1957). Not surprisingly, it is usually taken for granted that the lectures and demonstrations from which they learned will be equally effective in teaching villagers new food habits (Burgess, 1952).

Although similar basic concepts regarding foods and "folk medicine" are found in some regions in Central and Latin America (Foster, 1951), and also in certain Asian and Middle Eastern countries (Ammar, 1954; Freedman, 1954; Shiloh, 1958), dietary patterns and details of general beliefs vary from area to area and sometimes from village to village. Hence the stress laid on the need for detailed study of the particular area before any nutrition education is planned. Other conditions which seemed to the anthropologists to militate against the success of the health or nutrition improvement programs studied are summarized and discussed here.

The main difficulties appear to have been caused by:

1. lack of appreciation at the outset of the full implications of certain educational procedures;
2. lack of knowledge of the economic and practical limitations of the village household—coupled with a too rigid adherence to, and insistence on, textbook practices;
3. lack of sympathy with the beliefs, practices, and people on which the villager had hitherto relied for guidance in health matters;
4. lack of knowledge of the resistances inevitably aroused by advice and instructions that appeared contrary to the local beliefs about child rearing and the causes of ill-health;
5. lack of adequate explanation of the purpose and methods of functioning of the available health and nutrition services;
6. lack of cooperation, at administrative and community levels, among the personnel of the various services;
7. lack of scrutiny and testing of educational material to make sure that it conveyed the message intended and was easily understood by those to whom it was addressed;
8. lack of appreciation of the relative uselessness of a scheme imposed from above, as compared with the effectiveness of beginning with something in which the villager was interested and prepared to cooperate—even if it was not directly connected with nutrition.

Discussion

(1) Lack of appreciation, at the outset, of the full implications of certain educational procedures—School gardens are frequently encouraged in an attempt to introduce and accustom the young to a more varied and nutritious diet. The anthropologists suggest that they are more likely to fulfill this purpose if the homes from which the children come have already the space required for home gardens, the means of controlling the domestic animals which all too frequently wander at will in and around the houses

and streets, the wherewithal required for cooking, preserving and storing the new foods, and if the parents are at the same time being taught how to make the best use of the foods grown (Kelly, 1956).

Similarly, school meals, or the provision of free meals to children, will be more valuable educationally if the parents are invited now and then to partake of the food their children are learning to enjoy or, better still, can become at least partly responsible for the preparation and serving of the meals to the children (Kelly, 1956).

An account of a school-feeding program carried out in a rural area in Iran confirms the value of the last suggestion (WHO Report 1959).

A critical report (Hayden, 1954) of a pilot project in community development carried out on a small island in the South Pacific shows (among other things) the danger of lack of foresight about the probable results of a multipurpose approach. The preliminary survey disclosed that only one child under five years of age had died in the two years preceding the survey. Notwithstanding this unusually healthy record, the mothers were exhorted to change their child-rearing practices, to wean their babies at the "proper time—nine months," and to cultivate more regular sleeping and toilet habits in their children. Moreover, another part of the general development plan was to introduce the growing of rice as an additional crop. What the ultimate effect of these two innovations—if adopted—would have been on the health of the children (especially if the introduction of a rice mill had been a further step in this planned progress) is not hard to imagine.

On a wider scale, it was found in India that the expansion of successful community development pilot projects carried out (with resulting agricultural and nutritional improvements) could not proceed unless changes in the land tenure system could also be achieved (Converse, 1951).

(2) Lack of knowledge of the economic and practical limitations: too much insistence on textbook procedures —In some areas cookery classes or demonstrations held in a health or social welfare center proved more popular with the well-to-do women than with the mothers of families most in need of nutritional improvement. In these circumstances, the setting and utensils used had little resemblance to those found in the poorer homes, and the women could not, in fact, put into practice the methods they were being taught (Freedman, 1954; Kelly, 1954).

Elsewhere it was found that simple demonstrations in the home, showing how familiar meals might be improved, are appreciated and effective (Foster, 1951).

In Malaya and Indonesia, doctors and nurses—ignoring or unaware of the fact that the sale of an egg will provide enough money to feed the entire family on dried fish or cereal for that day —have repeatedly exhorted poverty-striken mothers to let their children eat these valuable marketable goods (Freedman, 1955). Similarly, in many parts of the world much effort has been wasted instructing mothers, who cannot tell time by the clock, to feed the baby "regularly every four hours" (Burgess, 1955; Foster, 1952), and much harm done by insistence on weaning "at the proper time—nine months" when no suitable protein food other than breast milk is available, and the family food is too coarse and highly spiced for the child's immature digestive system (Platt, 1954).

Again, in rice-eating countries where beri-beri is a problem, highly-milled rice is preferred to undermilled, and the rice is usually washed several times before it is cooked, thus causing a further loss of the essential vitamin B_1. Educational efforts are constantly being made to persuade the women to reduce the number

of times of washing the rice and so conserve some of the remaining vitamin. These efforts are not on the whole successful, for if rice of a certain consistency and flavor is desired, and the culinary facilities are extremely limited (as is the case in most rural peasant homes), then "good-tasting" rice can only be achieved by thorough washing in several waters, before cooking.

(3) Lack of knowledge and sympathy with the beliefs, practices and people on which the villager has hitherto relied in matters of health, and (4) the resistance aroused when these are neglected—For the purpose of discussion these two subjects are practically impossible to separate and are therefore considered together.

In their reports, the anthropologists repeatedly stress the need for some knowledge of, and respect for, the local beliefs about the causes and prevention of ill-health, and particularly the reasoning behind the permissible combinations or the incompatibilities of certain foods.

For example, where worm infestation is general among the child population, mothers are apparently more concerned about this aspect of child health than any other, and are usually prepared to cooperate willingly in any curative procedure to deal with this easily recognized menace to the child's health.

But rapid acceptance of advice, based on scientific knowledge, on the prevention of "worms" must not be expected. The frequently found beliefs as to the capacity of some foods to "cause worms" or "disturb the worms" are not isolated ideas, easily discarded. As every anthropological report implies, they are part of a whole body of traditional knowledge about human anatomy and physiology, health and disease, life and death (Read, 1948). "On an explicit cognitive level, food distinctions and assessments are a frame of reference for daily food habits, a reference guide to the diagnosis of illness, a set of proscriptions for prevention and a set of prescriptions for cure. And, on an implicit or below consciousness level, they form part of the nonreasoning endowment with which the villager learns to respond to food, health, and illness" (Wellin, 1954). Until the mother bases her daily "do's" and "don't's" to the child on scientific rather than traditional knowledge, such beliefs will persist, though her actual behavior may become modified for other reasons.

Twenty-five years ago this writer, like many before her, began trying to dispel the belief that fish and eggs could not be given to preschool Malay children because these foods would "cause worms." This belief still exists in rural Malaya today, but the mothers do not now withhold these valuable and available sources of protein from their young children. They argue: "What does it matter if the child gets a few worms, we can buy good 'worm medicine' from the shop" (McArthur, 1959).

To the anthropologist, this does not seem strange. Foster (1958) reviewing past experience, writes: "The evidence overwhelmingly indicates that popular disease theory changes extremely slowly but, given the pragmatic and essentially empirical attitude of most people, medical practices and behaviour can be changed very quickly. 'Seeing is believing,' even if not understanding."

It has frequently been advocated that the distribution of skim milk should be used as a focus for nutrition education. Where milk is a customary food, this is certainly wise. But where milk is not habitually given to children, or is unacceptable to adults, the underlying reason for its unpopularity must be sought before any education is attempted. When a suitable compromise which will permit its use has been found, and the accompanying education adapted to local conditions, the demand for milk usually increases (Cassell, 1957; Dorolle, 1953; Freedman, 1956; Mead, 1953).

Education based on the use of milk

has suffered in the past from the fact that the communities most in need of this additional food do not have the knowledge nor the facilities for the preparation of a safe uncontaminated liquid milk. Mothers have complained that the milk makes their children ill, and confidence in the value of the food, and the education, has been undermined. In communities such as Wellin (1954) describes, boiling of milk and boiling of water are carried out for different purposes and have no connection in the people's mind with each other, or with the destruction of possible contaminating organisms. Milk is boiled to remove its "coldness," and water is boiled to make it a suitable fluid for use in illness or convalescence, and its taste is usually disliked because of the association with ill-health. Here, and elsewhere, the best all-round compromise is that advised by most child health specialists today—that the milk powder should be added to and cooked with the familiar gruel or cereal porridge given to young children in most cultures (Jelliffe, 1955).

Wherever possible, however, the use of a familiar and locally available food is preferable, especially for the older children. One part of the pilot project already mentioned (Hayden, 1954) was a midday meal for schoolchildren, and skim milk was provided. As long as the milk was provided free, the children, after a reluctant start, obediently drank this unfamiliar fluid. When a small sum was charged daily, the true "acceptability" of the milk was revealed. It was successfully replaced by an excellent soup made from the abundant fish and some local vegetables, and prepared by the recently organized committee of women who continued to do so with considerable tenacity after the team had left the island.

Where local beliefs and prejudices have been taken into account by pediatricians and health workers, parents have not hesitated to cooperate—with beneficial results for the children.

One pediatrician reports: "In a West Bengal rural child welfare clinic, it appears that this (the treatment of children recovering from diarrhoea) is best achieved by adopting three local dietary remedies, which appear to coincide exactly with the scientific viewpoint . . . the carbohydrate chira mondu (hand-mashed flat rice), and as the pectin food, a sherbet made of the Indian wood apple (aegle marmelos) . . . (and) dilute lassi (acid buttermilk). . . . The buttermilk, being both acidified and defatted and a tonda ('cold') food is particularly suitable from all points of view" (Jelliffe, 1956).

The Health Division of UNRWA has found that, in the homes of the Arab refugees in Jordan, the use of rice water, as "boiled water," and tea with sugar is a familiar and reliable way of providing the fluids necessary in the first stages of infant diarrhea—while the traditional labaneh (a form of yoghurt) made with skim milk provides a safe and acceptable basis of further treatment (WHO Report, 1958).

A number of local remedies such as rubbing and massage, poulticing the abdomen, giving infusions, and some customs such as the selection of special days for going to hospital, or taking medicine, need not always be condemned (Adams, 1951; Freedman, 1956; Jelliffe, 1956). It is more than likely that they will be carried out anyway, if the child does not make a quick recovery, and that is rare where malnutrition is concerned. Moreover, a sympathetic attitude to such practices tends to increase the confidence of the people in the trained doctor's competence to deal with the different maladies of childhood, including malnutrition (Adams, 1951; Foster, 1951; Freedman, 1957; Wellin, 1954).

Several factors seem to operate in favor of the acceptance of nutrition education in different parts of the world.

In Central and Latin America, food is

valued as conducive to good health and strength, and there is a real desire to eat well if funds permit and to spend any extra money on food (Freedman, 1957) rather than on clothes or jewelery, as happens in parts of Indonesia (Freedman, 1954), or on cattle or land, as in Africa (Read, 1948).

Some traditional systems of medicine contain a definite recognition of personal responsibility in the avoidance of ill-health (Adams, 1951; Shiloh, 1958; Needham, 1959). This attitude of mind is more favorable to the educator than one which tends to ascribe all misfortunes to the will of Allah or some other deity, or values religious merit for the old more than the nutritional health of the young (Burgess, 1950).

In at least some parts of Central America there seems to be a useful empiricism in the mother's attitude as to what her child can and cannot eat. Each child in the family is treated individually in this respect, and food is not withheld from one child because it appeared to disagree with another. The pregnant woman is encouraged to eat well and to drink strengthening gruels during lactation (Freedman, 1956).

Here also, the frequently expressed anxiety of the mother as to whether the breast milk will "come," and the belief that if the child suckles too vigorously the supply will give out—a fear which leads her to give the baby some other food during the early months of lactation —might be used to encourage an interest in nutrition education during the antenatal period (Freedman, 1956).

The possibility of enlisting the cooperation of the locally valued health educators, the various types of "curers"—including the important "specialist" in child health the midwife, and the local pharmacist—should not be dismissed lightly (Foster, 1958; Wellin, 1955). In so far as scientific medicine threatens their prestige and livelihood, they are likely to undermine rather than reinforce any education which casts doubts on their practices. There is, moreover, evidence to show that they are ready to accept and use new ideas in the form of drugs or injections and might welcome further knowledge which enabled them to practice more successfully in the villages (Wellin, 1955).

At the present time, a good deal of research is being carried out in different parts of the world to find new cheap sources of protein which are locally available, and can be made suitable for the young child. The results so far suggest that where the new food is cheap enough, can be easily obtained, and introduced into the dietary pattern without any major change in the habitual methods of food preparation or consumption, it is readily accepted and used.*

(5) Lack of adequate explanation of the purpose and functions of the available health services, or the provision of unpopular services—The failure of rural peasant communities to understand, and the resentment created by health facilities which do not provide treatment as well as measures for the prevention of ill-health, was first authoritatively described by an anthropologist (Foster, 1951). The experiences and reactions he describes are not limited to Latin America, but have occurred in many parts of the world (Adams, 1951; Freedman, 1954; Freedman, 1957; Marriott, 1953; Mead, 1953; Koos, 1954; Wellin, 1955).

At an international seminar attended by directors of child health from many countries now building up their Public Health Services it was agreed that "at the moment, it was essential for the maternal and child health services to

* For further discussion of the preparation, introduction and acceptance of new protein-rich foods for children see "Malnutrition and Food Habits," report of a multidisciplinary conference organized by the Josiah Macy Jr. Foundation (New York), and the World Federation for Mental Health (London), in Cuernavaca, Mexico, September, 1960 (in press).

carry out curative activities, and that the concept of the exclusive 'well-baby clinic' . . . was both unpopular with the people and impracticable until the level of child health became higher" (WHO Report, 1958). The child with malnutrition is often first seen at the MCH center and an ailing child cured is one of the most convincing forms of nutrition education, and a sound foundation for further progress toward the acceptance of new or unfamiliar foods in the child's home.

It has been found, however, that qualities other than technical efficiency are important from the villager's point of view, and determine the extent of the influence of the medical and health services.

The instructions in the Quran to ". . . take counsel with them in the affair" for "hadst thou been rough and rude of heart they had dispersed from around" still hold good (El Bedri, 1959). No matter how strong the mother's anxiety, or her desire to see her child's health improve, she cannot but be daunted by an uncongenial atmosphere in the clinic or hospital where she seeks advice. Too much haste, failure to examine the child properly according to the mother's standards, lack of clear and adequate explanations of what she is to do, failure to prescribe medicine for a sick child, and ridicule of the mother's homely remedies are all resented, and militate against the possibility of educating the mother whose child is perhaps on the verge of grave malnutrition (Foster, 1951; Freedman, 1957; Wellin, 1955).

Where it is possible to admit the mother of a sick child to a hospital with the child, this experience is a real and rewarding education for the mother, and ultimately for the other women in the village to which she returns with her child (Robinson and Hecht, 1956). Elsewhere an alteration in the visiting hours might enable the mother to see for herself how the child is being fed, and an interview with the doctor in charge would provide an opportunity for her to learn what to do when the child is well enough to go home (Freedman, 1957).

(6) Lack of cooperation, at administrative and community levels, among the personnel of the various services—This is a common problem, not only among those working in rural peasant communities. In Great Britain, for example, nutrition education for a mother and her preschool child may, or may not, be carried out by various medical authorities as well as by the radio, press and television, and the advertisers. There is no universally established means of insuring that the "facts" taught by one person or agency will agree with those taught by any other—and experience has shown that especially on the subject of infant feeding, the mother is likely to receive a number of contradictory injunctions.

Where definite personal efforts have been made to establish good working relationships between the different medical authorities, continuity of care and education has been achieved and the mother's confidence reinforced (Morris, 1955).

In countries at present developing their health and welfare services, the potential nutrition educators (public health workers, home economists, teachers) may have been trained in different schools, or even in different countries, and their ideas on child feeding and weaning, for example, may vary in detail. The details may not be important from the point of view of the general health of the child, but they are most confusing to the villager. Auxiliary personnel such as sanitarians or assistant-midwives may not have received any training in nutrition at all, but they, and the humblest servant in the health center, will certainly be consulted by the people—if only to explain the advice and instructions of the less approachable doctor or nutritionist.

An essential step in any nutrition improvement program is, therefore, the establishment of some means whereby the content of the education to be carried out can be discussed and defined, and made known to all members of all the services.

An arrangement of this sort, which allows the personnel of different services to meet occasionally and get to know each other, may have other beneficial results. One anthropologist working with a health project was asked to seek the reason for the nonattendance of the villagers at the health center. In the end, he found that the difficulty lay with the members of project staff themselves (Adams, 1954).

(7) Lack of scrutiny and testing of educational material — Dissatisfaction with the response to nutrition and health education, in terms of changes in food and health habits, has stimulated a growing interest in the whole problem of how people learn, and the comparative effectiveness of different educational methods and teaching aids.

Knutson (1952, 1953, 1953, 1955) in the United States and Burton (1954, 1958, 1958) in England, describing the general principles underlying the use of audiovisual aids, emphasize the influence of the viewer's own background and experience in his interpretation and understanding of any such media, and the need to try out any material on a representative audience before it is used widely. Others, writing about the use of specific media,* also stress the need for careful preliminary testing and subsequent adaptation of any educational aid before it is finally produced for wide distribution and use, as well as later attempts to evaluate its effectiveness.

A great deal of nutrition education is carried out among illiterate populations. The inappropriate use of some posters displayed in many maternal and child health centers, and the incomprehensibility of some nutrition demonstrations in rural areas have aroused comment and some useful suggestions (Foster, 1951; Freedman, 1954; Jelliffe, 1955). Health and nutrition workers everywhere are now giving a good deal of thought to the choice and effectiveness of various educational methods (Bond, 1958; Burton, 1958; Clark, 1958; Derryberry, 1958; Rosenstock, 1959) and to the production, pretesting, and evaluation of teaching aids (Holmes, 1958; WHO/FAO Report, 1956; WHO Report, 1959).

In Natal, Ward and Jacob (1959) found that "Cultural beliefs were a highly significant factor influencing interpretation" of a variety of health and nutrition posters shown to groups of African and Indian women, and that the size of the group was also important. The smaller the group the greater the cultural influence on the interpretation of the poster.

The findings of the Health Education Department of the Ministry of Health, Province of Egypt, United Arab Republic, on the use of posters, films, and other educational media are fairly typical of the kind of knowledge that can and has to be acquired if educational efforts are to succeed. They are summarized in the report of an International Seminar on Health Education held in Tehran in 1958 (WHO Report 1959).

It was found that in the rural areas:

a. Posters are useful, provided that they are given into the hands of the people and left with them to study at leisure;
b. It is better, especially in schools, when showing a film, to give an explanatory lecture after the film rather than before;

* Useful material on all aspects of the preparation, use and evaluation of different educational aids, and on various educational methods can be found in the regular issues of the Health Education Journal, Central Council for Health Education, London; The International Journal of Health Education, 3 rue Viollier, Geneva; Fundamental and Adult Education Journal, UNESCO, Paris; and in "Teaching Better Nutrition," FAO, Rome; and Public Health Monograph No. 8 "Pretesting and Evaluating Health Education," Public Health Service, Publication No. 212, Washington, D. C.

c. An instructive film which is entertaining in itself is more effective than a purely instructive film accompanied by a purely entertaining film;
d. Written material should be supplied only to the local leaders, and not directly to the people, except for children above the third school year;
e. A health calendar, designed to carry health information to the small farmer by means of a drawing, unaccompanied by a written text, proved disappointing in its effect. The illustrations conveyed little to the majority of the villagers (WHO Report, 1959).

The same seminar agreed "that in the production of visual material, meticulous care is necessary in every small detail, as well as a thorough understanding of the mentality, customs and values of the people for whom it is intended; and that more study of the reactions of illiterate people to 'pictures'—posters, photographs, filmstrips and films—is needed."

(8) Lack of appreciation of the effectiveness of beginning with something in which the villager was interested—even if it was not directly connected with nutrition—For several reasons this is probably the least easily accepted comment made by the anthropologists and educationalist on nutrition or health improvement programs. Our own cultural background, with its accent on competitive speed in most aspects of life and on quantitative gains or losses, makes it difficult for us to believe that in qualitative changes, the race is not always to the swift. Moreover, many administrators of health or nutrition programs are medically trained and have retained the customs and attitude of the responsible authority, who makes a diagnosis and orders the necessary treatment. It is natural that they should bring this same attitude to the problem of dealing with the ill-health of a community, and hard for them to realize that, at the outset, they may have little prestige or place in the village culture.

Unhappily also, their diagnosis and proposed treatment of the ills and needs of the community are usually quite different from those of the people themselves (Manuwa, 1953; Sower, 1955). A team of public health workers, carrying out a malaria control program in the heart of Africa, tried to enlist the help of the villagers. They explained carefully that they had come to get rid of the mosquitoes—a nuisance and a menace to the health of everyone—and were told: "But it is not the little mosquitoes that trouble us, it is the elephants, who ruin our crops. Help us to kill the elephants and afterwards, if you want, we will help you to kill the mosquitoes."* Similarly, attempts to persuade the members of an Egyptian village community to build a well in order to safeguard their health were successful only after it had been pointed out that the treasured buffalo, on whom the whole working life of the family depended, would no longer risk breaking its leg on the muddy banks of the river—an all too familiar tragedy (WHO Report, 1959). Elsewhere, classes in nutrition, part of a rural health and welfare program, were ignored by the poorer members of the community, but an eager interest was expressed to the anthropologist in learning to "do addition," to "tell the time by the clock," and to read and write. Literacy classes proved a success and the beginning of wider interests (Kelly, 1954).

The following statement explains why health or nutrition improvement plans so often meet with little enthusiasm at first. It is taken from a description of how a typical poverty-striken, malnourished, apathetic community, heavily infected with schistosomiasis, was helped to organize its own preventive measures. "Few people realized they were sick as most of them did not know what it was to be well. . . . Furthermore, since most of them were ignorant of the causes of the diseases and attributed sickness variously to the alterations of cold and heat, to the contrast of cold and warm foods ingested at the wrong moment, or

* Reported at a WHO conference in Africa.

to supernatural forces—among them 'the will of God' and . . . 'the evil eye' —they did not see the need or value of changing their patterns of sanitary life." At the outset, the people felt that their greatest needs were electricity and transportation to the town, medical services, a water supply, a shopping center and work opportunities—in that order, and the majority thought that only "Government" could take the necessary initiative to get something done. Beginning with six couples, fortnightly discussions centered around these problems. Education about health matters was slowly introduced, and in three years much had been accomplished—including women's clubs for the teaching of home economics, and a food cooperative (Hollanda, 1959).

This is only one of an increasing number of accounts of successful community development of health and welfare programs. Most of them mention the people's lack of awareness of their nutritional deficiencies. All confirm the wisdom of a slow beginning, with much discussion and explanation, and the benefit, in terms of sustained cooperative effort, of starting with something chosen by the people themselves, or with some not too unfamiliar activity.

Similarly, agricultural education is likely to proceed smoothly if it begins slowly, with simple improvements in known agricultural technics within the power of the farmer to put into practice easily, rather than with radical changes such as the introduction of complicated machinery and the cultivation of entirely new crops (Erasmus, 1952; Kelly, 1956).

If it is agreed that the evidence points to the fact that one of the essentials for a successful nutrition improvement program is a detailed knowledge of the area of work, the question arises: "How can nutrition workers acquire this vital knowledge?"

Sometimes he or she may take part in the comprehensive preliminary survey which has to be made to determine the nature of the nutritional element in the general public health problem of the community (Rao, 1959; Scholes, 1954). But if this is not possible—"The anthropologist finds that an initial period of living in a village, where everyone is aware of how he lives and eats and sleeps and washes, and where he takes part in whatever is happening in the village, greatly helps to break down, in 99 cases out of 100, the initial mistrust felt by villagers for an outsider. It does more, for it disposes the village people to cooperate with him in whatever he wants to do or to discover" (Read, 1957).

The writer found that quite a short time spent living in a Malay village changed her approach to some of the education she had been carrying out in rural maternal and child health clinics. Some of the child health practices advocated had to be amended, or discarded altogether—either because they were now seen to be impracticable in the actual environment, or relatively unimportant when viewed against the general health needs of the family as a whole.

To include this experience in the training or apprenticeship of all potential nutrition field workers is today the aim of those responsible for raising the standards of nutritional health of the malnourished communities in different parts of the world. In countries now building up their public health and welfare services, field experience is a normal part of the training of some categories of public health personnel (WHO, 1958; Weber, 1958).

In the older universities and teaching schools, social scientists are contributing more and more to the training of doctors, nurses, nutritionists, and other health workers (United Nations, 1957). "To the extent that graduates of such schools can be indoctrinated in the social science concepts and methods, their work in in-

tercultural situations should be more effective" (Foster, 1958). Most nutrition education today takes place in "intercultural situations," even where it involves fellow countrymen.

"But the test of truth in matters of practice lies in the facts of life, for it is in them that the final authority resides" (Aristotle). The "facts of life"—nutrition education programs that have been functioning long enough to permit a periodic evaluation of the results—are hard to find. Outstanding are the accounts of the work of the Pholela Family Health Service (Kark, 1952) which show what can be done with time, vision, and well trained staff. Here, groups of families received curative and preventive services from teams made up of a family doctor, a family nurse, and a community health educator. The educator was usually an African health assistant who had received some training in anthropology and the psychology of education. Over the years, people slowly began to grow and eat a large variety of vegetables, to drink milk (despite a strong taboo on the drinking of milk by women) and to eat eggs more frequently. "In the course of twelve years the infant mortality dropped from 276 to 96, kwashiorkor all but disappeared from this area and the average weight of babies at one year had increased by two pounds. This trend, as far as was known, was not occurring elsewhere in the country, and in fact, in neighboring areas where the Health Center provided only medical care but no community health education program, no such changes were discernible" (Cassell, 1957).

Health assistants with some training in the principles of anthropology and education are indeed "an Innovation" and, it appears, an effective one. Where nutrition education has proved disappointing in the past, could it be that the field workers' "retention of Custom" has been as "Turbulent a Thing" as that of the villagers?

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A political scientist looks ahead at the development of personal care services (public health, welfare, mental health and retardation, correction) in state government and suggests a fresh approach. It is always of interest to see ourselves as others see us, and readers concerned with the problems discussed by Dr. Frost are urged to reflect on his comments.

STATE PERSONAL CARE SERVICES

OBSERVATIONS ON THE ORGANIZATIONAL FUTURE

Richard T. Frost, Ph.D.

MUCH is written of spectacular changes on the horizon of public care services. Progress in biochemistry's knowledge of mental retardation, or successful experiments with group therapy technics in some correctional institutions are examples. Yet the literature in social welfare reveals one disturbing fact. Whereas pioneering attitudes, fresh new approaches, and a steady rise in the professionalism of staffs are competently reported, much less is written of the meaning of these developments for the governmental arrangements which will either help or retard their success.

Like the substance of programs addressed to societal ills, governmental organization patterns have a discernible obsolescence rate. It is, however, much slower, largely because of "political" factors in the good sense of the word politics. All agencies have clienteles which have created a vested interest in stability. No one who sets out to reexamine administrative workways can ignore this fact. At the same time, broad new programs which reflect basic change in professional approach should have an important impact on organizational patterns.

The following observations are addressed to one of the major organizational characteristics of public care services—the policy-making board of laymen as agency or institution director.

State officials know that basically new approaches cannot be managed with yesterday's governmental devices. This is not to say that the administrative instruments of a previous era were not precisely appropriate; but presumably, newer instruments will be needed to meet the necessities of new programs. What are the characteristics of personal care services in the future? What tools will be needed by public administration in the states?

Character of Future Programs

1. There will be a continuing and rapid change in knowledge and technics, and in the numbers and kinds of people who will be needed to staff care services.

2. Problems will increasingly overlap

functional boundaries within state departments, among state departments, and between state and local units. Moreover, public and private responses will be meshed even further.

3. The public institution will diminish in importance and take its place as one point on a full circle of services which begins in the community and ends there as well.

4. The previous three characteristics indicate that there will be an unprecedented need for citizen participation on a broad scale, especially in the roles of public interpretation and community involvement.

These characteristics should startle no one. Consider for a moment the radical change in discharge and length-of-stay patterns in mental hospitals since the advent of tranquillizer drugs, or the success of special classes for retardeds in the public school districts where progressive states have encouraged them. Consider the multiproblem family which is now identified by welfare agencies which bring a number of services to bear rather than the treating of each malady in a separate way.

Forces of isolation always present in departments of government are giving way to cooperative ventures by interdepartmental committees or even integration of personal care services under one department.

Hospital wards and prison compounds will hardly be empty tomorrow—population increases will see to that; but a net decline in hospital populations can be expected and a refinement of probation and parole standards could slow the rate of increase in prison populations.

Too many millions in public funds have been invested to suggest abandoning our big public institutions. This is not the point. The future indicates that new institutions must be smaller and nearer to the sources of their clientele. Hopefully, new beds and wings will not be added to oversized colonies situated in rural areas. Most institutions now built can be used effectively as way stations in a treatment route which originates in community facilities near the home and terminates there also. They will cease to be the end of the road for hundreds of thousands of unfortunates who either cannot or will not live in the open society.

Administering Care Services

Over the country, administration of mental health, retardation, and correctional institutions indicates a fairly consistent evolution of organizational arrangements. All states are in some stage of this evolution which runs from:

A. Wholly independent institutions, each reporting directly to the governor and/or the legislature, which are managed by a single administrator—often a political appointment—or by a board of trustees or managers of nonprofessional and nonpaid laymen; to

B. A loose federation of most or all institutions under a state board which sets "general policy" (in this stage, local boards are occasionally retained although their exclusive powers are presumably circumscribed to fit the newer arrangement); to

C. Direct, central state control over institutions with a state agency headed by an all-powerful board or commission or, more recently, a single administrator appointed by, and responsible directly to the governor, often with an advisory board.

Several examples of these stages are in order. Connnecticut, Arizona, Arkansas, Mississippi, and New Hampshire administer correctional institutions by separate local boards of trustees reporting directly to the governor and legislature.

Kansas merges its mental health, retardation centers, juvenile industrial homes, and welfare programs under one three-member state policy-making board which appoints a director of social welfare. Wisconsin, likewise, merges mental hospitals and welfare programs and in-

tegrates correctional institutions as well. A nine-member Board of Public Welfare appoints a director of public welfare and the "Board shall be regulatory, advisory, and policy-forming, but not administrative or executive."*

New Jersey is an example of the exclusive power a board often holds. The State Board of Control over all mental health, retardation, and correctional institutions, as well as welfare programs, is given "complete and exclusive jurisdiction, supreme and final authority." That state also retains the older local boards over the institutions, giving them "management, direction, and control" powers "subject to the ultimate authority of the Board of Control." (One might report, parenthetically, that this all-too-general arrangement has caused confusion and conflict between Trenton and the field for many years.)

This evolution depicts a combination of political, professional, and lay control over state personal care services. Such a combination was not imposed as a one-time comprehensive plan for ideal government. It grew up over the years in response to historical phenomena influencing government. Since then, it has attained theoretical strength generated by argument over the best organization for these services. It is the opinion of this writer that the basic historical defense of lay boards is largely obsolete while the theoretical is still timely and useful. Let me explain.

Lay boards with administrative control came into American government in the middle of the 1800's. They came in response to a serious social illness—the almost unbelievable depths of incompetence and dishonesty to which state and local governments had fallen. Relationships between the knowledge public positions required and the particular incumbents were indeed hard to find. The public trough was open to all who would play the game—rich and poor alike.†

This period in governmental history boiled on through the turn of the century and, diminishing under the impact of major reform, up through our times as well. Most states have developed administrative competences unknown to that era, and some are comparable to any large organization—public or private. Yet, state government in America has never really recovered from the dark days of abuse.

The lay boards and commissions were established mainly to remedy the evils of improper politics whose real victims, of course, were the poor souls in public institutions incompetently managed. The horror stories are well known and need no exemplification here.

The growth of these boards was rapid. Allen Richards reports:

> Every time a new law was passed, a new undirected board was created. In 1919, New York State had 116 independent authorities, Minnesota 75, Illinois 100, Massachusetts 61, and Idaho 42—all exclusive of constitutionally created elective officers.[1]

Hundreds upon hundreds of these boards are still in office in the states. The 1950 study by the Council of State Governments showed that in a sample of only 21 states, there were 310 major departments under the direction and control of a board or commission.[2]

The historical reason for boards over service departments is fast waning. Many reasons come to mind:

1. Administrative problems inherent in large service departments today are wholly different from the days of a handful of institutions which were largely custodial. The use of comprehensive, executive budgets; central pur-

* Wisconsin is apparently able to separate these roles in daily practice, although there must be a certain amount of tiptoeing on the part of board and director at times.

† The record shows that when Boss Tweed went to jail, it was Mr. Jay Gould who bailed him out.

chasing and property systems; effective civil service programs; central statistics and planning agencies; directorships of administration at state level—all of these are merely examples of a world unknown to those who originated these boards.

A lay commission with "supreme and final authority" is obsolete in a state where the professionalization of administration has been well developed. It no longer has such authority, in everyday practice.

2. The increases in institutional and noninstitutional case loads are such that simple size alone has created management and control problems which defy a part-time, lay board however competent its members may be. Most boards were created before government at all levels went into the vast welfare programs now extant. Budgets are 10 and 20 times greater; employee numbers have multiplied time and again. It is one thing to see that local politicians do not plunder a particular institution; it is quite another to live successfully in a large family of related institutions which demand major portions of a state's tax resources.

3. Although there is much yet to know, our professional leadership has developed knowledge and abilities in treating human ills quite unknown to the era in which these boards arose. True, feeding, clothing, and housing huge institutional populations are still a major undertaking, but the prime mission of leadership is treatment not custody. Here again, a lay board with powers of management and control often finds itself a rubber stamp in spite of statutes which award it "policy-making" powers.

4. As part of the changing competences of leadership, one notes changing public attitudes about the victims of misfortune. Imprisonment is no longer the sole function of a correctional facility. In the older time of board origin, probation and parole were either in infancy or unknown. The contributions of anthropology, psychology, and so on, are receiving wide public notice. The retarded child, once a terrible embarrassment, has become a legitimate object of public concern.

5. Changing public attitudes are reflected in the rise and impact of citizen groups which focus their energies on personal case services. There have always been the private charities and the occasional militant reformer, but America in the 1950's contained a wide array of interest groups which are well led and well financed and which have an important impact on public care programs. Consider the associations for mental health, for retardation, and for correctional rehabilitation. Moreover, the galaxy of large and small welfare organizations is now organizing under central leadership.

In light of these organizations, and noting their competence, one wonders whether the governmental boards have not lost much of their earlier—and important—mandate to serve as a public watchdog.

6. Social incompetence is found everywhere, but the rapid increase in urbanization in this country is bound to increase it. Many studies have demonstrated the higher incidence of maladjustment inherent in complex, tense, urban life. Beyond this, urbanization means mobility both for people and in communications. There is no "welfare problem" in Spokane County or Hartford County; there is the Washington welfare problem, the Connecticut welfare problem—and regional welfare problems as well. Again, the question arises as to the wisdom of placing "supreme authority" in a part-time lay board whose responsibilities are restricted to minute geographical areas.

This obsolescence is wholly natural. It is not the result of conscious efforts to reduce the hegemony of power cen-

ters. Indeed, time and events have simply cut much of the ground out from under the boards.

One might contend that there is still enough "politics" in state administration to retain boards with their present powers, and every scheme for public administration must meet this contention honesty. There will always be occasional poor governors, poor legislative leadership, and mediocre administrators. But should we construct a public administration designed to frustrate these men only? It is the import of this writing that adequate protections are now alive in the society to repel the plunderer and infuse the public's conscience in the important work of care services.

Lay boards with administrative power over service departments should be reexamined. Some contend that they should be abolished, that the clean, clear line from governor down through the lowest echelon should be built and maintained. Granted that this would put responsibility and authority directly and precisely, it would not answer the basic problem of public care services.

The problem, as all the officials know, is adequate public interest, adequate public support, and a resulting adequate pool of competent staffs to serve these enterprises (not now existent no matter how big budgets are).

In meeting that problem, the boards and commissions have a great future role to play. It will not be the same as that in the past, but it will reward the dedicated citizens, who give enormous amounts of time and heart to this work, with satisfactions not now enjoyed.

A Proposal

Statutes which now give service department boards and commissions power to "manage, direct, control, administer, appoint, supervise, make policy, discharge" or similar executive functions should be rewritten to cast these boards in a new role generally as follows:

1. To inspect functions of a department at any time.
2. To report regularly to the governor, legislature, and the public on conditions and problems in a department.
3. To interpret the mandate of a department to the public, particularly to the surrounding communities where institutions are located.
4. To advise departmental management on housekeeping and plant, food service, new construction, institutional location, etc.
5. To appoint and assign duties to special committees, councils, or whatever, to operate state-wide conferences on personal care services, to act as special study groups on particular problems, or to act in any way the board deems useful in proselytizing its own role as interpreter and surveyor of a department's work.
6. To encourage institutional-community ties by helping to foster community facilities which relate to institutions, by generating visits and seminars among interested groups and the institutions, by stimulating volunteer services, all designed to reduce the isolation of institutions and to lodge them in an orderly circle of services.
7. To stimulate and arrange research opportunities by members of universities, foundations, etc.
8. To stimulate care-service integration by board member visits to related institutions at home or in other states, attendance at professional meetings and at the meetings of other boards serving in related departments.
9. To receive from the executive staff such presentations on departmental policies as it may wish to consider and appraise.
10. To attend departmental, executive, and legislative budget hearings as observers and participants when called upon.

This proposal may appear to change the actual role of boards and commissions in some states only slightly. If so, the change would be significant. For such a mandate would redirect the lay element of a department toward surveillance and support rather than time-consuming details of direction and management. It would also retain the critical "watchdog" functions of citizen boards and enlarge their duties as interpreters of a department's work.

Moreover, the proposal permits a state

to continue receiving the invaluable advice of competent laymen in matters within their ken. It also continues the deterrence of improper political intrusions into a department's programs and personnel policies. Lastly, and no less important, it imposes executive responsibilities clearly on a department head and his staff and removes widespread ambiguity in this regard today.

Conclusion

Professor George Graham of Princeton once noted that "he who would build a convincing theory of public administration must be able to make up his mind about man and society." This is not the medium for such a discourse. Yet, one or two principles might be suggested. Is it not time to trust the emergent professionalism of government in these service fields? Has not a timely balance been struck between the nature of politics and a public concern for these social illnesses which permits rearrangement of governmental devices designed, ideally, to respond to both?

One thing is sure; at some point, the current muddle of mixed authority and responsibility between part-time boards and full-time executives will work its woe against the very citizens it is built to serve—the unfortunates among us who for whatever reason are unable to to cope with societal demands.

Laymen are needed in these care services. They have particular competences in the generating of public interest and support which no professional leadership can develop for itself. It is time to shift gears and reconstruct the role these laymen can best play in the future.

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1. Richards, Allen. "Traditions of Government in the States," in The Forty-Eight States. New York, N. Y.: The American Assembly, Graduate School of Business, Columbia University, 1955, p. 55.
2. Reorganizing State Government. Chicago, Ill.: Council of State Governments, 1950, p. 17.

Dr. Frost is a member of the Political Science Faculty, Reed College, Portland, Ore.

Parental Accident Prevention

"Is Your Child Safe?," a safety check list, poses questions that parents can answer "yes" or "no." The first ten questions deal with general home measures, while others pinpoint safety precautions in various areas of the household including kitchen, laundry, bathroom, bedrooms, basement, as well as the family automobile. Coverage includes precautions on accidents involving falls, burns, medicine and poisons, sharp instruments, moving mechanical parts, toys, and automobiles. Published as a public service by the National Society for Crippled Children and Adults, 2023 West Ogden Ave., Chicago 12, Ill.

Public health law is a subject which is treated rather infrequently in the public health literature. For this reason we welcome this basic presentation by Dr. Hamlin which we feel will prove useful to many readers of the Journal.

PUBLIC HEALTH LAW OR THE INTERRELATIONSHIP OF LAW AND PUBLIC HEALTH ADMINISTRATION

Robert H. Hamlin, M.D., M.P.H., F.A.P.H.A.

LAW, itself, is a social science which expresses society's organized planning and self-regulation. It is the system of rules by which a community or series of communities determines (1) the conduct, rights, and powers of its members, (2) its own actions for the members' benefit, and (3) its permissible interference with the freedom of these same members. Any rule answering this description is, if authoritatively promulgated, a law.

The term public health law requires more precise analysis and definition. A generally accepted definition of modern public health itself is that given by Dr. C.-E. A. Winslow who stated:

> "Public health is the science and the art of preventing disease, prolonging life, and promoting physical health and efficiency 'through organized community efforts' for the sanitation of the environment, the control of community infections, the organization of medical and nursing services for the early diagnosis and preventive treatment of disease, and 'the development of the social machinery' which will ensure to each individual a standard of living adequate for the maintenance of health; 'organizing these benefits' in such a fashion as to enable every citizen to realize his birthright of health and longevity."

The terms "through organized community efforts," "the development of the social machinery," and "organizing these benefits" are quoted here to emphasize those activities in public health in which the law and its understanding are of vital importance. It is the law which provides one of the major mechanisms by which the objectives of public health may be realized.

From this explanation it may be more clearly understood that the term "public health law" expresses the application of general legal principles to the practice of public health. Public health law is not a separate, distinct series of legal principles different from those applied to other professions or interests. It is the subject matter—public health—to which the principles are applied that is special. The same general legal principles will pertain to many other areas of social action and activity.

Classification: Types and Sources of Law

Types of Law

Types of law may be classified in several ways. Unfortunately, many of the classifications overlap, are incomplete and incomprehensible, or do not permit the public health worker to apply the classification to his own duties in a practical manner.

In order to best illustrate the interrelationship of the types of law to their sources of authority, the following classification of the general types of law is used:

1. Constitutional law
2. Statute law
3. Administrative law
4. Common law

Constitutional law describes generally the plan and method by which the public affairs of government—federal, state and local—are to be administered. More specifically, it is concerned with the organizational plan of government, the powers of sovereignty, the distribution of political and governmental authority and functions, and the fundamental principles which regulate the relations of the government and the people. A constitution is the enumeration of these accepted principles in a written document or their establishment by usage formally recognized.

Statute law, or "written" law, is law created under constitutional authority by the enactment of legislative bodies whether federal, state, or local. These enactments are called "statutes" on the federal and state levels of government, but most frequently "ordinances," "codes," or "by-laws" in local government. Thus, a constitution is the organic law of a state or the nation, the adoption of which by the people constitutes the political organization, as distinguished from statutes made by legislative bodies acting under the authority of the constitution.

Administrative law is law authorized by the appropriate legislative body and subsequently created by the various subdivisions of government (such as official health agencies) prescribing in detail the procedure and content of the subdivisions' programs and activities. These enactments of the governmental subdivisions are called, variously, "rules," "regulations," and "orders." They have the effect of law.

Common law, or "unwritten" law, is law based on social policies, usages, and customs which have been recognized, affirmed, and enforced under constitutional authority by the courts. The determinations by the courts establishing the common law are known most commonly as court "decisions," "judgments," "decrees," and "orders."

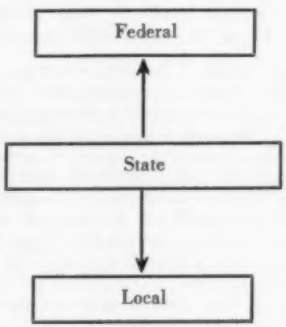
Sources of Law

To understand the sources of law (as against the previously discussed types of law) both a vertical and horizontal analysis must be made of our political or governmental organization.

Vertical Organization of Government —Vertically, government is organized in descending fashion in the following levels:

1. International
2. Federal
3. Regional (among several states)
4. State
5. Regional (among several localities)
6. Local

This descending order—descending order in size but not necessarily in respective power and authority—is often simplified into the following three levels: federal, state, and local. Their respective powers may be diagramed as follows:



Historically, the authority of the federal and local governments has derived from the states. The federal government has only those powers originally granted

by the states and embodied in the federal constitution; all other powers are left to the states. Localities, in turn, presently have only those authorities delegated to them over a period of years by the state constitutions and the state legislative bodies.

The "police power" is the inherent authority conferred by the American constitutional system upon the individual states through which the states may regulate whatever affects the peace, good order, morals, and health of the community. This authority or power is broad in scope (much more than most public health personnel realize) and is generally indefinable in its limitations. It is limited only by the powers conferred in the federal constitution and the general federal and state constitutional guarantees such as due process of law, equal opportunity, freedom of speech and religion, and so on.

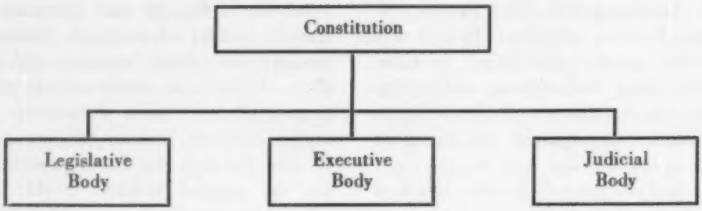
The question as to what are the proper limits of the state police power in a specific situation is a judicial one. In a long and fluctuating line of decisions by our courts it has been held to include quarantine restrictions, fire and building requirements, draining marshes, licensing of various activities such as slaughter houses and restaurants, exclusion of paupers and immigrants, caring for the indigent, regulating numerous activities such as highways and peddlers within the state, prohibition and abatement of nuisances, right of entry into premises for inspection purposes, control of the sale of adulterated and simulated food products, regulation and reporting of communicable diseases, and provision of medical care.

The powers of the federal government to act in health and welfare matters are direct and indirect. Direct powers permit specific acts by federal agencies and their personnel, such as building and operation of hospitals for veterans, merchant seamen, Indians, and so forth; quarantine restrictions for persons and products in foreign and interstate commerce; control of materials transported through the postal system; and provision of medical services for military personnel and their dependents. The major indirect federal powers are exercised through the fiscal power to tax for the general welfare of the people. The best working examples are the numerous grant-in-aid programs (in tuberculosis, crippled children, water pollution, roads, housing, etc.) in which the federal government through its greater taxing ability provides funds on a voluntary basis to states which, to qualify, must meet certain federally created standards.

The powers of our local governments in health and welfare services vary considerably from state to state depending upon the past and present delegation of state powers by the individual states through their state constitutions and the periodic acts of their legislative bodies. It is impossible to generalize on the local authority for self-determination. The presence of "home rule"—or the lack of it—is a description of the degree of willingness of a state to delegate the right to self-rule to a local government.

Horizontal Organization of Government—On each of the previously discussed vertical levels of government there are three general horizontal branches: legislative, executive, and judicial. This is shown in the next diagram.

The interrelationship of these three branches of government is determined by the separation or balance of powers doctrine basically defined from the distribution of authority in the constitution (or charter in case of a locality). The body that deliberates and enacts laws is legislative; the body that judges or determines the application of the laws to particular cases, their constitutionality, etc., is judicial; the person, or body of persons, who carries the laws



into effect, or superintends their enforcement, is executive (a health agency is part of the executive branch). On the federal level of government, these bodies are respectively the two houses of Congress, the Supreme Court and its lower courts, and the President and officials subordinate to him; on the state level the same respective bodies are the state legislature, the state supreme court and its lower courts, and the governor with his subsidiary personnel; on the local level, the city council or county commissioners (or other possible names for the legislative body), the local courts, and the mayor (or other possible individuals or groups with the executive power). The health agency, regardless of the level of government, is always a part of the executive branch.

Lawmaking by Official Health Agencies

The source of the legal authority of an official health agency stems from its position as a part of the executive branch of the government. As such, the general legal powers of a health agency are as follows:

1. Quasi-legislative (the authority to make rules, regulations, and orders).
2. Quasi-judicial (the right to hold hearings and to revoke or suspend licenses, etc.).
3. Executive or administrative (the mandate to plan, develop, and operate programs, etc.).
4. Investigative (the right to make inspections, etc.).
5. Educational (the authority to undertake general education of the public, personnel training, etc.).

These powers are not inherent in a health agency. The general authority within which each act or program of an agency is performed must have been previously granted by the legislative body.

As among constitutional, statutory, administrative, and common law, it is administrative law with its authority to make rules and regulations which should be the primary concern of public health workers. Constitutional law, statutes, and common law as interpreted by the courts must be considered since it must be within their authority that the health agency may act in developing its programs and rules and regulations. Nevertheless, the preparation and supervision of rules and regulations in health matters is primarily the responsibility of public health workers, while the interpretation of the other types of law (constitutional, statutory, and common) belongs to the lawyer who will define the permissible scope within which the health agency may operate its programs and make its rules and regulations.

Health agencies to the fullest extent possible should therefore define and develop their programs under general statutes of the legislature which in turn delegate to the agency itself a power to make the rules and regulations defining the more specific program procedures and content. As a corollary, the specific substance of a program should not be embodied in statutes and local ordinances enacted by legislative bodies. Flexibility to adapt to changing pro-

gram needs and the utilization of the public health worker's professional expertise will be greatly diminished if only statutes and ordinances are utilized without relegation to rules and regulations.

Conclusion

Law as it relates to public health is concerned with education, programing, services, and their organization and performance. It is therefore part of the daily life of the public health worker. It is not to be utilized only sporadically when difficulties are encountered.

The law is a resource which must be used with all other resources such as health education, trained personnel, adequate facilities, and sufficient funds to accomplish the proper organization and operation of our health programs. An appeal to our legal system is often a prerequisite action to obtaining these other resources.

For these reasons, it is necessary that public health workers have a framework of understanding within which they may recognize, analyze, and understand their specific legal powers and problems.

Dr. Hamlin is associate professor of public health administration, Harvard School of Public Health, Boston, Mass.

Share Your Journals with Asians

The United States Committee of The World Medical Association is sponsoring a project to send used professional journals to physicians in Asia. Specialty journals are needed, particularly the American Journal of Public Health.

Readers who wish to participate in this program should write to the committee at 10 Columbus Circle, New York 19, N. Y., listing the journals they wish to contribute.

A description of a state program for rheumatic fever prophylaxis is described. The author discusses the coordination of the administrative machinery, the choice of the prophylactic agent, and the provision of funds as the factors that have been responsible for the effectiveness of the program.

ADMINISTRATIVE ASPECTS OF A STATE-WIDE RHEUMATIC FEVER PROPHYLAXIS PROGRAM

George H. Agate, M.D., M.S.P.H.

IN JANUARY, 1956, the Michigan Department of Health undertook a program of prophylaxis of streptococcal infections in patients who had had one or more attacks of acute rheumatic fever. The program provided for the free distribution of penicillin to physicians for use on any patient in which he judged its use was desirable, provided the case had been previously diagnosed as having rheumatic fever and was not in an acute stage of the disease. This was in accordance with the recommendations of the Rheumatic Fever Control Committee of the Michigan State Medical Society, the American Heart Association, and the Michigan Heart Association. The program is built around the family physician, and is in accordance with the time-honored practice of the Michigan Department of Health to supply prophylactic antigens and biologics to physicians free of charge, for use on any patient.

About one-fifth of the drugs supplied by the Michigan Department of Health for this purpose are used by the Michigan Crippled Children Commission for its control program in patients under their care and for which they bear the cost of office visits only.

Benzathine penicillin G for monthly intramuscular injection was selected as the drug of choice and was the only drug distributed during the first year of the program. Its advantages are (1) intramuscular injection guarantees that the patient is actually receiving the medication; (2) intramuscular injection tends to maintain a more stable blood-level of penicillin; (3) the method requires a monthly visit to the doctor's office, thereby affording an opportunity for closer supervision and better follow-up, an objective otherwise more difficult to attain.

Benzathine penicillin G is packaged in sets of four disposable syringes (a four-month supply) in two dosages—600,000 units for small children, and 1,200,000 units for larger children and adults.

Sulfadiazine for daily oral use was added to the program in 1957 to cover those patients who were sensitive to penicillin, or who developed sensitivity. Sulfadiazine is supplied to physicians in a five-month supply (three factory-pack-

aged bottles containing 100 tablets of 0.5 gram each). The recommended dosage of sulfadiazine for this use is 1 gram (two tablets) taken once daily. For patients under 60 pounds in weight, a lesser dosage may be recommended by physicians.

All drugs used in the program are purchased by the Michigan Department of Health from unallocated general funds. The distribution is through the channels already established for biologics distributed by the department. These are the official health departments of cities and organized counties. In unorganized counties, this function may be taken over by county nurses, hospitals, or physicians.

The physician desiring drugs must certify each case and the drug desired to the distributor on a form (Form C-62-A*) supplied by the Michigan Department of Health. If the request is in order, he is supplied with a four-month supply of benzathine penicillin G, or a five-month supply of sulfadiazine as may have been requested. When the initial supply for the patient is exhausted, request for further medication is made on a form (Form C-62-B*) with a progress report. This report will indicate the date of each injection if penicillin is used, whether or not a recurrence has occurred, and the extent and duration of any untoward reaction. All request forms are made in triplicate by the physician. The original request form is retained by the distributor; one copy is returned with the requested medication to the physician, and the second copy forwarded to the Michigan Department of Health.

The stimulation of rheumatic fever reporting occasioned by the program is apparent. These figures are not believed to represent the true occurrence of rheumatic fever, but to more accurately portray the participation of physicians in the program of free drugs. This participation varies with both physicians and communities.

Finance has represented a major problem. Thought has been given to limiting the program to children to reduce cost. This was abandoned when it was realized the cost for adults was small and the value accruing to those dependent on it was considerable. Overuse is rare. Underuse and dropping from the program is of more real concern. A voluntary limitation of the state-supplied drugs to those who might otherwise go without the protection thus afforded has been strongly urged. To institute any "means test" would be contrary to the long established policy of the Michigan Department of Health.

The cost of penicillin for the first year of operation was in excess of $13,000. In 1960, over $29,000 was spent for penicillin and sulfadiazine. On January 1, 1961, records indicated that 2,528 patients were active under the program and that 3,430 who had received at least an initial issue of drugs

* Forms are available from the author upon request.

Reported Cases of Rheumatic Fever, Michigan Department of Health

Before Prophylaxis Program Was Initiated				After Prophylaxis Program Was Initiated				
1952	1953	1954	1955	1956	1957	1958	1959	1960
765	697	604	426	1,407	1,318	1,320	1,567	1,690

Initial Requests in State Office for Prophylaxis for Rheumatic Fever

	1956	1957	1958	1959	1960
Number of requests	1,113	1,081	1,123	1,250	1,391
Cost of benzathine penicillin G	$13,349.28	$18,388.88	$20,120.96	$24,516.27	$28,032.63
Cost of sulfadiazine	None	478.80	413.10	942.42	1,053.96
Total cost	$13,349.28	$18,867.68	$20,534.06	$25,458.69	$29,086.59

had ceased using those provided by the state. Studies were made in 1960 to determine why patients failed to continue with the prophylactic medication provided under the program through local distributors. It was found that over one-half of the "drop off" group had moved; however, the majority of these who could be located were found to be continuing with prophylactic medication. Of the remaining 44 per cent, the majority stopped on medical advice and only 12 per cent of the total "drop offs" could be attributed to patient indifference. In this later group the exact cause was difficult to determine. Many claimed an unawareness that it was important to continue with a program of prophylaxis. There is considerable variation in the advice of physicians as to the length of time prophylaxis is considered necessary.

Until research brings us a better approach, the incidence of rheumatic fever can be reduced significantly by an appreciation and early awareness on the part of all to the importance of adequate therapy of streptococcal disease. Once rheumatic fever has occurred, morbidity and mortality can be reduced by diligent protection of its victim from subsequent streptococcal infection. Continuous year-round prophylactic medication seems presently to be the most effective and generally applicable method to accomplish the prevention of rheumatic fever recurrence.

The state of Michigan, through close cooperation of private medical societies and state governmental agencies, has established a program to prevent recurrence of rheumatic fever in Michigan residents. In this program, the administrative machinery, the choice of the prophylactic agent, and the provision of funds have all been coordinated to maintain the maximum effectiveness and responsibility of the family physician in safeguarding the health of his fellow citizens.

Dr. Agate is director, Division of Epidemiology, Michigan Department of Health, Lansing, Mich.

This paper was presented before a Joint Session of the American Heart Association, the American School Health Association, and the Maternal and Child Health and Public Health Nursing Sections of the American Public Health Association at the Eighty-Seventh Annual Meeting in Atlantic City, N. J., October 22, 1959.

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Journal of Public Health

EDITORIALS

Conservative Medicine

Austin Flint in 1872 clearly delineated the responsibility of the physician and the community in health protection of the adult, and coined the appropriate phrase "Conservative Medicine."[1]

"Conservative Medicine," says Dr. Flint, "means preservation of the vital forces. It covers everything which prevents the impairment of, or tends to develop and sustain, the powers of life. The practice of conservative medicine is the responsibility of both the practicing physician, and also the health officer who is in charge of community efforts for health promotion.

"Chronic disease, affecting an important part, may continue for a greater or less period, and recovery may finally be complete, but during its continuance the powers of life are more or less impaired. It may destroy life by leading to incurable lesions or by its protracted duration.

"Under all circumstances, the affection is less likely to be prolonged, serious changes in structure are less likely to take place, and fatal termination is postponed in proportion as the vital powers are preserved.

"Conservative medicine therefore dictates measures which tend to sustain the powers of life in chronic disease. It dictates measures to develop appetites, to provide abundant nutritive supplies and all other hygienic measures which invigorate and strengthen the body.

"Conservative medicine is particularly applicable to those chronic affections collectively which destroy by gradual inroads upon the powers of life (examples are carcinoma, tuberculosis, diabetes, cirrhosis, and Bright's disease). With a view to prolong life, when recovery is not expected, the great object is to retard, as much as possible, the failure of the vital forces.

"Patients with incurable disease are too often abandoned merely to palliative measures, the fatal issue being merely a question of time, and therefore not of much importance. The question however may be highly important to the patient and to his friends. To aid in the cure of disease is undoubtedly the first aim of the physician, but when a cure is not to be effected, then comes the prolongation of life, even with health more or less impaired.

"In the management of any incurable affection, conservative medicine dictates the measures which in general terms, will contribute to keep the body in the best possible condition, compatible with the continuance or progress of the dis-

ease. In this way, not only the inroads of the disease on the powers of life, but the destructive lesions may often be stayed. An incurable illness is sometimes held completely in abeyance, and the system rendered so tolerant to its continuance, that life may be preserved indefinitely, although a vital organ is affected."

We have quoted at length from the essay of Dr. Flint, because we have been so impressed with his vision, and his understanding of the future role of medicine, as it relates to the promotion of health of the people. He wrote this essay and developed the concept of conservative medicine nearly a century ago, yet we are just beginning to realize how important is his concept and how great a responsibility rests on our shoulders, not only in preventing disease, but also in conservation of the health of those who have developed a chronic debilitating illness, and are threatened with a destruction of their "vital powers."

We have, through the years, developed a series of procedures in preventive medicine and public health that have met the needs of the community. Most of these have been sound, and have had a strong influence in prevention of illness and promotion of health. Life has been prolonged, death prevented. Great advances have been made in reduction of the ravages of acute illness, particularly in childhood.

But our very successes have resulted in the emergence of new serious public health problems, for which we were not prepared, and for which we had developed no policies or procedures. The problem of chronic illness and all that it entails has become the outstanding unsolved task in preventive medicine and public health. It is a great challenge.

1. Flint, Austin. Essays on Conservative Medicine. Philadelphia, Pa.: Henry C. Lea, 1871.

The Journal is indebted to Dr. Wilson G. Smillie (now residing in Newfane, Vt.) for the above editorial.

Pneumoconiosis Among Pennsylvania Coal Miners

IN DECEMBER, 1958, an editorial in the Journal called attention to the plans of the Department of Health of Pennsylvania to study pneumoconiosis and silicosis among coal miners.[1] One of the chief points made in the editorial was that no large-scale organized studies had been undertaken in recent years to determine the size of the pneumoconiosis (silicosis) problem. Furthermore, the absence of effective control programs in the coal mines of the United States was emphasized. Pneumoconiosis (silicosis) is today the most costly occupational disease in the country, and yet relatively little is done to prevent it even though effective methods are available. Moreover, such action is essential since there is no cure for this disease.

Results of the Pennsylvania study are now available in two papers published in the November issue of the Journal of Occupational Medicine.[2] The investigators surveyed 25 per cent of a total population of 20,000 working, unemployed, and retired miners from four counties. The study group comprised 5,062 bituminous coal miners who presented themselves voluntarily for an examination comprising an occupational history, a 14 x 17 chest x-ray film, and a lung function test. Of this group, 4,276 were working and 796 were retired. The x-ray films were read by a number of leading radiologists independently of other information about the examinee. The findings are striking, to say the least. Of the miners examined, 28.4 per cent showed roentgenographic evidence of pneumoconiosis; 10.5 per cent of the working miners and 26 per cent of the retired miners had confluent lesions. It is worth noting that there are no comparable numbers of cases of pneumoconiosis (silicosis) and in the mortality data or workmen's compensation records for Pennsylvania.

The authors are aware that the miners who volunteered for this study may not be representative of the population in which they are interested. Did most of the miners who are well volunteer for this study, or most of those who had symptoms? For this reason it is difficult to draw conclusions concerning the absolute value of the figures that are presented. However, even if all the nonparticipants had negative roentgenographic findings, the 1,300 with pneumoconiosis still are a large group for an industry where it had been claimed that there was no pneumoconiosis problem.

The only conclusion which can be drawn at this time is that because of exposure to dust a large number of bituminous miners in central Pennsylvania have developed pathological conditions of the lungs. Since the completion of the 5,072 examinations discussed above, another 8,600 miners in western Pennsylvania have been studied in the same way. It is planned to continue these surveys so as to reach as large a proportion of bituminous coal miners as possible in order to determine the incidence of pneumoconiosis in this group. Estimates of the incidence of pneumoconiosis in the United States vary greatly, and no accurate figures are available. The first step in prevention is to determine the extent of the problem; Pennsylvania has begun to do this and will continue. It is time that others joined in these efforts.

1. Editorial. Pennsylvania Attacks an Old Problem. A.J.P.H. 48:1660 (Dec.), 1958.
2. Lieben, J., et al. J. Occup. Med. (Nov.), 1961. (In press.)

LETTER TO THE EDITOR

To the Editor:

Reference is made to the editorial appearing in the July, 1961, issue of the Journal under the title "A Model Act for Registration of Sanitarians."

This writer is disturbed by the fact that the editor apparently had a rather limited knowledge of the background pertinent to this whole subject. In the second paragraph of the editorial a rather surprising statement is made as follows: "The establishment of standards will very likely mean that they will be accepted for civil service examinations." The inference here would appear to be that this is either undesirable, unneeded, or both. Then to add further confusion, this statement is made: "In turn this may affect the availability of sanitarians." By analogy one might say that medical health officers or nurses are in short supply. So we will drop registration and lower professional standards. Actually, one of the significant factors effecting the availability of sanitarians is the general lack of professional qualifications. This means that well trained people are in competition with others less qualified.

I would like to remind the Editor and call to the reader's attention that one of the stated objectives of the APHA is to encourage high professional standards on the part of "all" public health workers. Furthermore, I would point out that the professional examination service conducted by the Association is tangible evidence acknowledging that some measure of qualifications and fit-

ness is conceded to be desirable. If this were not so, the Association should abandon its examination service.

Next I wish to present some facts in support of registration for sanitarians:

1. An act having a purpose similar to the one in question is currently in effect in 18 states. While each act has as its primary objective the promotion of better professional qualifications, there is a considerable lack of uniformity among them. Faced with this situation, the Sanitarian's Joint Council promulgated an act which is offered for use by other states as a model. It was the opinion of the council that uniformity in this kind of legislation had merit.

2. As indicated by a footnote on page 1061 of the July, 1961, Journal, the Model Act resulted from the combined efforts of designated delegates from the two largest sanitarian's organizations, as well as delegates appointed by the Engineering and Sanitation Section of APHA. The Model Act was unanimously endorsed by the Joint Council and subsequently has been endorsed by the membership of the National Association of Sanitarians and the International Association of Milk and Food Sanitarians. The combined membership of these two associations is about seven thousand.

3. In 1956, the Committee on Professional Education of the APHA published a report in the September, 1956, issue of the Journal entitled "Proposed Report on Educational and Other Qualifications of Public Health Sanitarians." On page 1155 of this issue the following statement appeared: "The graduate public health sanitarian who is technically equipped to function effectively in public health will unquestionably gain professional status through a properly enacted registration act. Such acts should not be so restrictive, however, that personnel with long experience and demonstrated ability are excluded. Registration generally deals with recruitment of new employees who must qualify through educational preparation and experience."

I know from personal experience that the CPE is a well respected committee and one which gives careful attention to professional qualifications and standards. This report is a matter of public record and the statement quoted above denotes committee concurrence with the principle that registration for sanitarians is one means of attaining professional status.

Finally, I would point out that well trained qualified competent sanitarians presently occupy highly responsible positions in public health departments and with industry throughout the country. Many hold graduate public health and other degrees. Their performance is both creditable and professional in character. These men recognize that legislation alone is not the complete answer to professional advancement and recognition. However, they do recognize legal registration as a step forward toward the objective of higher professional qualifications.

It is hoped that the Governing Council will take favorable action at its forthcoming meeting and will concur with action already taken by the two other associations who hold representation on the Sanitarian's Joint Council.

HAROLD S. ADAMS, F.A.P.H.A.
Associate professor of public health, Indiana University Medical Center, Indianapolis, Ind.

EDITOR'S NOTE: Professor Adams' letter is published because of its relevance to the important subject discussed in the July issue of this Journal. The Editor assures him that the editorial was not intended to discourage or to disparage registration, but rather to encourage study of the proposed act so that if it could be strengthened any comments of such a nature could be called to the attention of the Association and of the Sanitarian's Joint Council.

NEWS OF AFFILIATED SOCIETIES AND BRANCHES

APHA Affiliated Societies and Branches

Society and Secretary

ALABAMA PUBLIC HEALTH ASSOCIATION, Dr. Allen N. Koplin, 1005 S. 16th St., Birmingham
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GEORGIA PUBLIC HEALTH ASSOCIATION, Mrs. Martha Power, State Health Dept., Atlanta 3
HAWAII PUBLIC HEALTH ASSOCIATION, Mrs. Mapuana P. McComas, 1018 Lunalilo Street, Honolulu
IDAHO PUBLIC HEALTH ASSOCIATION, Ralph Carpenter, 120 N. Capitol Blvd., Boise
ILLINOIS PUBLIC HEALTH ASSOCIATION, William J. Hixon, Evanston Health Dept., Evanston
INDIANA PUBLIC HEALTH ASSOCIATION, Malcolm J. McLelland, State Board of Health, Indianapolis 7
IOWA PUBLIC HEALTH ASSOCIATION, Lloyd Coe, Iowa Hospital Association, 1012 Liberty Bldg., Des Moines
KANSAS PUBLIC HEALTH ASSOCIATION, W. W. Wilmore, Kansas Tuberculosis and Health Assn., 1134 Topeka Ave., Topeka
KENTUCKY PUBLIC HEALTH ASSOCIATION, Peggy Fisher, 275 E. Main St., Frankfort
LOUISIANA PUBLIC HEALTH ASSOCIATION, George M. Ineichen, P. O. Box 1872, Monroe
MARYLAND PUBLIC HEALTH ASSOCIATION, C. Murray Wylie, M.D., 615 North Wolfe St., Baltimore 5, Md.
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION, Mrs. Elizabeth K. Caso, Dept. of Health, Cambridge
MICHIGAN PUBLIC HEALTH ASSOCIATION, Howard Hilton, Washtenaw County Health Dept., County Bldg. Ann Arbor
MINNESOTA PUBLIC HEALTH ASSOCIATION, D. S. Fleming, M.D., State Dept. of Health, University Campus, Minneapolis
MISSISSIPPI PUBLIC HEALTH ASSOCIATION, V. T. Hawkins, State Board of Health, Jackson
MISSOURI PUBLIC HEALTH ASSOCIATION, Mrs. Nadia Craver, 5th Fl., State Office Bldg., Jefferson City
MONTANA PUBLIC HEALTH ASSOCIATION, Mrs. Lou Esmay, City-County Health Dept., Great Falls
NEBRASKA PUBLIC HEALTH ASSOCIATION, Mrs. Jack Carey, Lincoln Dairy Council, 620 Sharp Bldg., Lincoln
NEVADA PUBLIC HEALTH ASSOCIATION, Mrs. Elaine Walbroek, 101 W. Arroya, Reno
NEW JERSEY PUBLIC HEALTH ASSOCIATION, William J. Chamberlain, 118 W. State St., Trenton 8
NEW MEXICO PUBLIC HEALTH ASSOCIATION, Mrs. Mary Gilliland, State Dept. of Public Health, Santa Fe
NEW YORK CITY, PUBLIC HEALTH ASSOCIATION OF, Frances Ann McVey, 4317 Robinson St., Flushing 55, N. Y.
NEW YORK STATE PUBLIC HEALTH ASSOCIATION, Carline Millican, Rochester Regional Office, State Health Dept., Rochester
NORTH CAROLINA PUBLIC HEALTH ASSOCIATION, Helen Craver, P. O. Box 2975, Winston-Salem
NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, George E. Michaelson, P. O. Box 325, Bismarck
OHIO PUBLIC HEALTH ASSOCIATION, Mrs. June O'Donnell, 3516 Braddock St., Dayton
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Bill Burk, 3400 North Eastern, Oklahoma City
OREGON PUBLIC HEALTH ASSOCIATION, Muriel David, City Bureau of Health, 203 N.E. 28th Ave., Portland
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, Emma J. Petach, R.N., 324 N. Second St., Harrisburg
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Mrs. Mae de Acin, Apartado 211, San Juan 2
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Emily Anne Easterling, Richmond County Health Dept., Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice Brady, R.N., State Dept. of Health, Pierre
TENNESSEE PUBLIC HEALTH ASSOCIATION, C. B. Tucker, M.D., State Dept. of Health, 420 Sixth Ave., N., Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, Joseph N. Murphy, Jr., State Dept. of Health, Austin
UTAH PUBLIC HEALTH ASSOCIATION, Katherine Brandon, M.D., P. O. Box 23, Foothill Station, Salt Lake City
VIRGINIA PUBLIC HEALTH ASSOCIATION, Robert M. Parker, 401 Colley Ave., Norfolk 7
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Vance McCallister, 1509 Public Safety Bldg., Seattle 4, Wash.
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Mrs. Katherine L. Brown, State Dept. of Health, Charleston 5
WISCONSIN ASSOCIATION FOR PUBLIC HEALTH, Paul Weis, RR No. 2, Waunakee
WYOMING PUBLIC HEALTH ASSOCIATION, Lee Holder, P. O. Box 2203, Cheyenne
MIDDLE STATES BRANCH, APHA, Thelma Luther, R.N., Dept. of Health, Des Moines 19, Iowa
SOUTHERN BRANCH, APHA, H. W. Stevens, M.D., Court House, Box 7525, Asheville, N. C.
WESTERN BRANCH, APHA, Robert G. Beaumier, 1309 Smith Tower, Seattle, Wash.

Seminars on Specific Diseases

The Communicable Disease Center has often received invitations to participate in the meetings of APHA Affiliated Societies and Regional Branches, but it has not always been possible to provide assistance at the time of request. Recently CDC decided that it could assist in a more meaningful manner if its participation could be preplanned and organized around a specific communicable disease subject. CDC then polled the officers of the state public health associations as to their possible interest in short seminars on specific communicable diseases and at the same time asked officers for topics which they thought might be of most interest to their own associations. The response indicated sufficient interest to justify development of the seminars.

CDC has notified all Affiliated Societies and Regional Branches that it is now prepared to develop a two-to-three hour seminar on hepatitis, polio, or syphilis

for presentation at affiliates' annual meetings between February 15 and December 15, 1962.

CDC will provide for each seminar a leading authority as speaker, an exhibit, printed material, visual aids, and case studies.

Affiliates availing themselves of this offer will be asked to provide a panel of state personnel to comment on the presentation and to present the state's policies and programs, experienced people to coordinate the presentation, and appropriate publicity.

Virginia: "In Tune with the Times"

The Virginia Public Health Association held its annual meeting in Roanoke on June 6, immediately preceding the three-day Virginia Public Health Conference. VPHA's five sections held business meetings in the afternoon. Delegates then assembled for a dinner meeting at which APHA Membership Secretary Marion Fry was the featured speaker.

Mrs. Fry's topic was "Are We Getting Our Public Health Associations in Tune with the Times?" After pinpointing recent historical developments in public health—for example, the Emerson Report, the concept of health developed by the World Health Organization—she cited the work of the APHA itself in keeping the ever-expanding horizons of public health clearly in focus. She pointed to the work of the Technical Development Board and its committees which are providing some of the solutions to the real problems in public health today—accidents, chronic disease, environmental hazards, disaster planning, medical care, mental health, radiologic health—through increased professional intercommunication and through its special publications, many now off the press and still more in preparation.

Symbolic of the deepening ties within the entire corps of public health workers, she asserted, is the closer relationship between APHA and its affiliates that has been achieved in recent years through various new approaches to strengthened professional solidarity. She noted, as typical of this, more integration between the work of affiliates and APHA Standing Committees; more effective two-way information services and public policy representation between the national and Washington offices and the state associations; increased joint postgraduate educational ventures such as the Continuing Education Program in the Western Branch and the Institutes on Association Management which to date have been held for officers of half the affiliates; and the mutual support of APHA and its affiliates in attempts to educate the public and legislatures to a correct estimation of their responsibilities in promoting effective health measures.

"In visiting other State and Branch Associations," she said, "I have sensed their real urge to do something as a professional society besides holding an annual meeting. They . . . are disturbed over what they could do in contrast to what they are doing." Mrs. Fry then spoke of how certain state associations are more and more coming to believe that to fulfill their stated goals they must extend their activities deeper into the community, tying them in with the practical day-to-day practice of public health. She gave as examples of such affiliate activities the development of manuals, provisions for research, the preparation of standards, and the promotion throughout a state of needed health services.

In conclusion she quoted the TDB's recent report, "Broadened Spectrum of Health and Morbidity," "This troubled world cannot afford to be passive or merely reactive to each new problem. It must take the offensive. . . . In a segment of the larger problem, public health . . . must . . . aim for the ultimate

ideal of optimum health for all people." What better organized force can there be for this offensive, she asked, than "strong, unified public health associations?"

At the Business Session which followed dinner, Helen W. Wiesman, R.N., assistant professor of nursing, Medical College of Virginia, Richmond, was installed as president of VPHA, succeeding William A. Dorsey, director of Public Health Laboratory, Richmond. Her fellow officers for 1961-1962 are:

President-Elect—John Hammer, M.D., M.P.H., regional director, Eastern Virginia, State Department of Health
Vice-President—A. Clarke Slaymaker, Alexandria
Secretary-Treasurer—Robert Parker, Norfolk

W. French Skinner, director of laboratories, Virginia Department of Health, received the VPHA Laboratory Section Award, being cited for outstanding accomplishment in public health microbiology.

The extensive scientific program of the Virginia Public Health Conference included such topics as relationship between private practice and public health, community needs in mental health, Virginia's attack on air pollution, trends in family nursing, and multilateral responsibility in school health.

Colorado: Applying Research Data

Public health agencies must have their Tiros I, II, etc., satellites as well as their earth-based meteorologists. This was essentially the message broadcast by the Colorado Public Health Association in an annual scientific program (May 18-19, Pueblo) entitled "Orbit and Re-entry." Orbit?—basic research. Re-entry (and the stresses it creates)?—application of research findings to the community.

CPHA President John S. Anderson, M.D., M.P.H., chaired the morning opening session at which Robert Dyar, M.D., Dr.P.H., gave some practical advice to delegates. The time is ripe for official agencies to begin research programs, since interest in public health is high, he said. Agencies should capitalize on this "and start getting money allocated for research." He favored research by tax-supported agencies in general and by health departments in particular because they are "traditionally responsible for the health of the community," and they would study the whole community. "Nowhere else can disease among groups of people be studied so effectively," he pointed out. Health departments now are making little use, he asserted, of research grant moneys available from government, private foundations, and industry. Dr. Dyar is chief, Division of Research, California State Department of Public Health, and chairman of APHA's Committee on Research Policy.

The other sessions of the 24th annual meeting dealt with four fields of research and practical application of findings—staphylococcus infections, mental health, pesticide poisoning, and nutrition.

Very little has been reported on the importance of fighting staph in the home, Dr. J. C. Colbeck, chief of service pathology, Department of Veterans, Vancouver, B. C., declared. "Housewives in particular," he said, "should be made aware of the danger to their families caused by staph organisms in the home." "The bathroom," he warned, "is the main breeding place of staph organisms in the home. The bedroom is next important and then the clothing." Dr. Colbeck recommended the exclusive use of showers in the home above tub baths as more hygienic. He also recommended the use of disinfectants to clean showers, tubs, and hand basins in the bathroom. Disinfecting is less expensive than medical treatment, he pointed out. Dr. Stuart Dunlop, associate professor of microbiology, College of Veteri-

nary Medicine, Colorado State University, discussed Staphylococcus aureus in animals.

Drs. Lester Libo and Charles Griffith, both of the New Mexico Division of Mental Health, described the development of mental health consultation services in areas with no other organized facilities and discussed the research evaluation methods used to define the consultation process and study the impact on local community organization of new mental health services. A practical application of mental health in communities was presented by Gene McGee, psychologist, and Naomi Kennedy, mental health nursing consultant, both with the Colorado State Health Department and the After-Care Program of the Colorado State Hospital.

Dr. Joseph H. Holmes, professor of the College of Medicine for the University of Colorado, warned of the effect on human beings of organic phosphate pesticides. Reaction time is slowed by the pesticides, which affects the nerves. Some deaths of crop duster pilots are blamed on the slowed reactions resulting from breathing the poisons, Dr. Holmes said. Use in the home garden may also have bad effects.

Dr. Inez Harrill, associate professor of foods, Colorado State University, told of research on relationships among nutrients, enzymes, and amino acid imbalance and noted recent studies of nutrition and vascular problems. Esther Eicher, nutritionist of the State Health Department, cited recent research findings, indicating that normal individuals do not need to make drastic changes in their diets. However, she added that authorities agree overweight persons should reduce, but under a physician's direction.

Space-age metaphors were put aside for space-age data at the final luncheon session. Dr. J. G. Gaume, chief of space biotechnology for the Martin Company in Denver, discussed "Problems of Space Feeding." Dr. Gaume said the human body is not seriously affected by being without appreciable weight for a short while, but the effect for weeks or months is being studied. He reported that animals will be orbited for weeks at a time, starting in less than three years, before human beings will undergo similar experiences. Dr. Gaume also spoke of work to produce a life support system which would supply food and oxygen and use waste products.

Mrs. Helen Beatty Noland of Durango was the 1961 recipient of the Florence R. Sabin Award. She was recognized for her work and contributions to public health in Colorado. The award was presented by Dr. Roy L. Cleere, who pointed out that, "It is . . . the dedicated, loyal worker who stays behind the scenes who is the real force in any movement for community betterment." Colorado Association of Sanitarians meeting in conjunction with CPHA gave its Milton M. Miller Award to Donald F. Marmande, chief sanitarian, Boulder County Health Department, for his dedicated and meritorious community health service.

Male delegates were invited to bring "flowered shirts and clam digger pants" and the ladies "sarongs and grass skirts" to Pueblo for the annual banquet, this year an Hawaiian Luau and entertainment, given at the headquarters hotel which features accommodations in the style of the 50th state.

Charles S. (Jack) Stanley, director of health education, Denver Department of Health and Hospitals, assumed the presidency of CPHA. His fellow officers for 1961-1962 are:

President-Elect—Martin D. Baum, D.V.M., M.P.H., director, Veterinary Public Health Services, State Health Department

Vice-President—Janelle Krueger, director of nursing, Boulder County Health Department

Secretary—Mrs. Neven Kilpatrick, director, Denver Dairy Council

Treasurer—Elizabeth Kaho, Ph.D., executive director, Denver Hearing Society

New York State: 57th Conference

The New York State Public Health Association, with its ten sections, is one of the several sponsors of the State's Annual Health Conferences, the 57th of which was held in Rochester, June 5-8. The wide scope of health interests represented and subject matter discussed at this meeting may be seen from the names of but a few of the other sponsors: Empire State Health Council, New York State Academy of Preventive Medicine, Association of School Physicians, Health Officers Association, and School Nurse Teachers Association. President of the 1961 conference was William A. Brumfield, Jr., M.D., health commissioner, Westchester County Health Department, White Plains.

Speakers at the first general session were: State Attorney General Louis J. Lefkowitz, who discussed "The Law and Public Health"; John M. Galbraith, M.D., president, Medical Society of the State of New York, who related the work of the society in 1961 to the public health program; and Herman E. Hilleboe, M.D., state health commissioner, whose topic was "New Directions in Medical Care."

Dr. Hilleboe opened with the statement that "Of all the real and moving issues in our field, one transcends all others. That issue is the provision of high quality medical care. . . . It is inevitable that we in public health concern ourselves with this. . . . Nothing so affects the health of the community as the level of medical care available to all its people." He spoke of the "exciting evolution" in the medical and social philosophy of the nation. "Issues have been earnestly debated. Much of the debate has raged about the questions of control and financing. But for the average American who gets sick and faces a big hospital and doctor bill, the issue of control is relatively unimportant. He is not too interested in who controls medical care in this nation. He is interested in getting well again and getting his doctor and hospital bills paid without sinking too deeply in debt." The only reason Dr. Hilleboe sees for the $35 billion a year health business in the United States "is to help the sick get well and to keep the well healthy. Any medical care system that is in any way detrimental to this purpose needs changing fast."

Many forces are determining new directions in community health practice, Dr. Hilleboe said, among them changes in population patterns, income distribution, in the nature of medical care itself, and in the roles of official agencies. The area of governmental health services is the obvious place, he said, to look for a "principle of growth" as a beginning point to solving some of the administrative aspects of medical care. "If we succeed in bringing order to the vast monolithic structure of governmental health services then the patterns we develop and the insights we gain will serve us as a reliable guide for the bigger job of ensuring sound health care to all of our citizens. It is certainly worth a try."

On the other hand, he said, "Providing good medical care is a job that transcends the prerogatives of any one department of government. We are going to have to stretch our imaginations enough to see clearly across departmental boundary lines if we expect to solve our public medical care problems."

The paper at the second general session was on "Sociological Determinants of Public Health Practice" given by Rene Dubos, Ph.D., of the Rockefeller Institute. Discussants of his talk were George James, M.D., first deputy commissioner, New York City Department of Health, Sol Levine, Ph.D., assistant professor of social psychology, Harvard School of Public Health, and Marjorie A. C. Young, Ph.D., assistant professor

of health education, Harvard School of Public Health.

Public health workers face a "peculiar intellectual dilemma," Dr. Dubos said. "On the one hand, they are professionally committed to the doctrine that it is possible to create a world free of disease. On the other, experiences teach them that as soon as one disease is rooted out, another one springs up to take its place."

Dr. Dubos indicated some of the changing patterns of disease (e.g., "who would have dreamed a generation ago that hypervitaminosis would become a common form of nutritional disease in the Western world"). He gave considerable attention to the effect of cyclical variations on all living things (e.g., "it seems safe to predict that an increasing number of essential biological activities will be found to be linked in some way to the natural forces operating in the universe"). Often, he said, the social and economic structure presents "insuperable difficulties" to the application of scientific knowledge. He took air pollution for his point. "To improve the design of combustion equipment and of gasoline engines, to increase the height of smokestacks, to reroute automobile traffic, to displace certain industries are steps compatible with technical knowledge which would either eliminate air pollutants or discharge them in areas where they would not constitute threats to human health. But these steps could be taken only at the cost of disturbing the economic structure of the community. How much economic prosperity and convenience of life is society willing to sacrifice to prevent future lung cancer, emphysema and chronic bronchitis? How can we balance the value of human suffering that will occur in some undetermined future against the effectiveness of the social performance of the community today?"

In conclusion Dr. Dubos spoke of the many control measures that could be developed but that "will have to be neglected in practice because of the limitations of economic and human resources." Thus choices will be forced on us that society as a whole must make "because they will involve value judgments." Because of this and since "medicine has now become so powerful, it has become urgent to integrate medical science into social conscience."

New York State Public Health Association presented its Hermann M. Biggs Memorial Award to George Baehr, M.D., chairman of the New York State Public Health Council. The first Haven Emerson Award in Preventive Medicine of the New York State Academy of Preventive Medicine was presented to Dr. Hilleboe. The State Health Department and State Civil Defense Commission Award of Merit went to Mary E. Jones, director of public health nursing, Erie County Health Department, for outstanding achievement in the development of civil defense medical services.

Wisconsin: "Communications, Inc."

Delegates to the 13th annual meeting of the Wisconsin Association for Public Health (June 20-21, Madison) were told at the first general session that public health pays, and it's up to public health workers to make this very clear not only to the legislature and other appropriating bodies but also to the general public. The speaker was Gaylord W. Anderson, M.D., dean of the University of Minnesota School of Public Health. Today's health budgets are inadequate, he said, because there is not enough public respect and appreciation of what has been accomplished in public health. He recommended that health departments give more consideration to ways in which they can render services, even small ones, to more people so they know that the public health department exists to be helpful, not just restrictive.

Such services can not always be justified in immediate dollar value, he conceded, but do pay off in better public relations and support in the future.

It should be impressed again and again on the public, Dr. Anderson said, that it does not spend money for public health, but invests it for a yield or return that is very much greater. He recommended, for example, that more emphasis be placed on comparing the cost of caring for sick people to the cost of immunization. He concluded that while "humanitarian concepts are still important we have to talk to legislative and appropriating bodies about the dollar value of public health."

In "Stop, Listen, and Listen" Robert B. Williams, commercial personnel supervisor with the Wisconsin Telephone Company, said "it is almost impossible to say anything that someone will not misunderstand." Public health workers have a particular problem in getting people to understand their technical terms. Even more important, he noted, they should listen well, else communications break down. "A listening response," he reminded delegates, "is a very brief comment or action made to another person which conveys the idea that you are interested, attentive, and wish him to continue. It is made quietly and briefly so as not to interfere with the speaker's train of thought."

"Food Safety: Communications and Public Relations" was the topic of Milton J. Foter, assistant chief of Milk and Food Research, Public Health Service, who stated that many public health people are not getting across information on food safety because of a tendency to talk to themselves. We can increase the safety, he said, only by striving for better understanding of statisticians' work, by improving our reporting, improving the dissemination of information, and striving for better communications with the community, the physician, the food packaging industries, and with all the agencies involved.

An "Epidemiological Problem: Communications in the Public Health Team" was the title of a panel discussion moderated by W. D. Stovall, M.D., coordinator, Postgraduate Medical Education, University of Wisconsin. A brief sketch of an outbreak of possible food poisoning was given, and then the audience was asked to question the panel so as to illustrate some of the problems of communication.

The second day opened with a symposium on communication in the eradication of syphilis. Presented were the "Picture in Wisconsin" by Arthur L. Van Duser, M.D., director, Division of Venereal Disease Control, State Board of Health; "The Picture in the Nation" by William J. Brown, M.D., director, Venereal Disease Control, Communicable Disease Center, Atlanta; "Syphilis Epidemic Controlled Through Emergency Measures" by Robert R. Swank, health program representative, CDC, Atlanta; and "Working with Private Physicians" by Kenneth P. Latimer, health program representative, CDC.

Robert Savee, Wisconsin Telephone Company, Milwaukee, then discussed communications in outer space, a scientist's dream a few years ago that has now become a reality. He gave interesting information regarding "Project Echo," the communication satellite, that periodically passes over your home and the miracle "Maser," a supersensitive ear.

Following this, Louis E. Remily spoke on "Communications in a Civil Defense Program." To communicate well in such programs, he said, one must select the audience, considering where they are, and what they are like; select the media through which they can be reached; continually attract the new generation; present special incentives; make the organization known; render a public service; dispel wrong impressions; and reach persons who influence others.

Theodore Wisniewski, director, Division of Water Pollution Control, Wisconsin State Board of Health, Madison, succeeded G. G. Shields, M.D., District 5 health officer, as president of the WAPH. New vice-president is Betty Krippene, dental hygiene consultant, State Board of Health district office, Fond du Lac. Paul Weis, Waunakee, was reelected secretary-treasurer.

A total of 249 persons registered for this year's annual meeting. A new feature of the meeting this year was the exhibits planned to offer suggestions for local health programs. Winners of the photo contest that WAPH sponsors included Clare J. Sprangers, R.N., Sheboygan; Eugene Hensel, Sparta; Luida E. Sanders, Madison; Gladys Steaven, R.N., Chilton, all for colored slides; and Isabel Larson, R.N., Kenosha, for a black and white print.

Northern California: New Section

San Mateo was the site of the Northern California Public Health Association's annual meeting on June 2. Section meetings in the morning were followed by a luncheon general session. Sections convened again in the afternoon.

Dr. Nevitt Sanford, general scientific director, Cooperative Commission on the Study of Alcoholism, spoke at the general session. This commission is a part of the Center for Advanced Study and the Behavioral Sciences at Stanford University.

A new section, Mental Health and Social Welfare, has been formed making six sections in NCPHA. For its initial meeting, this section looked at the "Modern Day Dilemma of the Geriatric Patient with Behavior Problems" and "Pre-hospitalization Services for Mentally Ill Persons." The Medical and Nursing Sections joined in the morning to discuss "Rehabilitation—Physical and Social Aspects"; in the afternoon the doctors considered "A Health Department's Approach to an Occupational Health Program." The Laboratory and Sanitation Sections held a joint session for presentations on radiological monitoring, consumer complaint samples, and the legal significance of samples and laboratory reports. Sanitarians orbited around the twin subjects of research and space sanitation. Laboratory personnel coupled research with a more down-to-earth topic, "Organic Pollution of Water."

The membership adopted seven resolutions at San Mateo. In one, NCPHA acknowledged the seriousness of the health problems of migratory workers. Members were urged to ask their respective governmental bodies to take the necessary steps for permanently eliminating the migrants' unhealthy living conditions and for providing necessary health services. Other resolutions dealt with the need for public health microbiologists, chemicals in food, and smoking and lung cancer. NCPHA also resolved to undertake an educational program to acquaint its members with the public health importance of family planning and voted to join with other appropriate agencies in taking all necessary steps to influence the creation of an interim state legislative committee to study the problems of hiring the handicapped.

New NCPHA officers for 1961-1962 are:

President—Alvin R. Leonard, M.D., director of public health, city of Berkeley

President-Elect—Ernest Bertellotti, chief public health educator, Santa Clara County Health Department, San Jose

Vice-President—Joan Davis, supervisor, public health nursing, San Jose City Health Department

Treasurer—Seiko Babo, laboratory director, Alameda County Health Department

Secretary—Nicholas Parlette, education associate, Western Regional Office, Western Branch—APHA, San Francisco.

American Public Health Association Membership Application Blank on Page XXXIX

EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health. Other information concerning vacancies and personnel available is on file in the Association office. Anyone wishing to have the benefit of this additional information can obtain it by writing to the Vocational Counseling and Placement Service of the Association.

Advertising space in these pages is available at special rates **to official** and **voluntary health agencies,** and individuals seeking employment. The charges are $5 for the first 50 words or fraction thereof and $1 for each additional 10 words or fraction thereof. There is no charge to members or Fellows of the Association who desire to utilize the **Positions Wanted** portion of these pages. **Closing date** for receipt of advertisments is the first of the month preceding the desired month of publication.

All correspondence should be sent to the American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

Dentist—with M.P.H. or public health experience, for city of 82,000 and county of 169,000 (three colleges) with active, respected public health program. Full cooperation of local practicing dentists. Salary $9,480-$11,760. E. F. Hersey, M.D., Director, Kalamazoo County Health Department, City Hall, Kalamazoo, Mich.

Physicians—Board-certified internists and OB-Gyns for nonprofit closed-panel group-practice plan in Santa Rosa, Calif. Salary $12,000-$15,000; vacation; sick leave; comprehensive health plan; retirement. Contact Charles W. Betcher, Administrator, Community Health Association, 2959 Bennett Valley Rd., Santa Rosa, Calif.

Disease Control Director—Plan, direct programs for investigation and control of diseases. M.D. plus four years' responsible experience in epidemiology and disease control. Colorado medical license or eligibility for licensure. Proposed yearly salary range $12,312-$15,384. Apply: Recruitment Officer, Career Service Authority, City and County of Denver, Denver, Colo.

Medical Director—of a state-wide nutrition program, organized as a major program unit in the Georgia State Health Department. Requirements: one academic year of public health (or certification in a specialty requiring considerable nutrition training and experience) and three years of professional experience in an official health agency conducting a generalized program. Liberal retirement and fringe benefits. Entrance salary $12,420, with advance to $16,080. Contact H. M. Chester, Personnel Service, Georgia Department of Public Health, 47 Trinity Ave., S.W., Atlanta 3, Ga.

Public Health Officer—to direct and coordinate public health laboratory, nursing, nutrition, and emergency health mobilization service programs of the Hawaii state health agency. Requires M.P.H. and six years' public health physician experience, three in an administrative or supervisory capacity. Salary $12,192-$14,820. Contact the Department of Personnel Services, 825 Mililani St., Honolulu 13, Hawaii.

Public Health Officer I and II—Positions with the Hawaii Department of Health. Grade I as administrator of county public health program on a half-time basis, and Grade II as assistant director of adult health. Requires M.P.H. and graduation from an accredited medical school and, for the I, two years' physician experience, for the II, three years' public health physician experience, one year in administering a public health service program. Salaries—I: $5,268-$6,402; II: $11,064-$13,440. Write to Department of Personnel Services, 825 Mililani St., Honolulu 13, Hawaii.

Medical Health Officer—for Springfield, Mass. (population 175,000). Modern public health program, including school health services. Staff: 60 full-time and 34 part-time employees. Excellent personnel policies. Qualifications: M.D., M.P.H., and experience in public health required. Salary $14,300 per year. Apply to John C. Ayres, M.D., 1414 State St., Springfield, Mass.

Commissioner of Public Health—for the city of Worcester, Mass., population 200,000. Minimum requirements: citizenship, M.D. from Grade A medical school, public health degree, practical public health experience. Well organized staff, 75 full time, 50 part time. Ideal living conditions. Maximum salary at present $15,000. Position now available. Apply, outlining qualifications and background, and salary desired, to Francis J. McGrath, City Manager, City Hall, Worcester, Mass.

Medical Administrator—for combined position of county health officer and director of accredited 80-bed general hospital. Posi-

tion requires eligibility for medical registration in the state of Michigan and some experience in both fields. Salary range $12,000-$15,000, depending upon experience. Apply, outlining qualifications and background, to Douglas H. Fryer, M.D., Director, Division of Local Health Administration, Michigan Department of Health, Lansing, Mich.

Public Health Director—Duties involve joint administration of Greene County Health Department serving approximately 30,000 population and the City of Springfield Health and Welfare Department serving 95,000 population. The city provides all normal public health services and also operates a modern 50-bed hospital and outpatient clinic for indigents. The public health program maintains excellent relations with the local medical profession. Requirements: M.D. degree from approved medical school and M.P.H. degree. Local or state public health administrative experience may be substituted for the M.P.H. degree. Salary open. Write to Department of Personnel, City Hall, Springfield, Mo.

Physician—to travel Midwest with mobile medical center equipped with x-ray and laboratory. Diagnostic examinations for nonprofit organization. Opportunity for wife as assistant technician. Write Medical Director, Garment Industry Medical Center, 4646 Lindell, St. Louis 8, Mo.

Medical Director—for state-wide Tuberculosis Control Program for the state of Nevada, with headquarters in Reno. Salary $1,007-$1,348, depending upon training, experience, and board certification in an appropriate specialty. License: eligibility for licensure in Nevada. Excellent recreational opportunities, including fishing, hunting, water sports, and mountain climbing. Exceptional fringe benefits. For further information contact Nevada State Personnel Department, Carson City, Nev.

Director, Division of Public Health and Preventive Medicine—Large general hospital. Must have M.D. and M.P.H. degrees. Will direct development of county-wide public health program. Excellent facilities. Salary open. Apply: Rufus R. Little, M.D., Superintendent, Bergen Pines County Hospital, Paramus, N. J.

Pediatrician—Board eligible or certified to work as public health physician with the Maternal and Child Health Division of the New Mexico Department of Public Health as medical director of a clinic for mentally retarded children, as well as general maternal and child health work. Write A. Looram, M.D., Director, Maternal and Child Health Division, State Health Department, Santa Fe, N. M.

District Health Officer—Tri-County Unit; headquarters Bend, Ore. M.D. and M.P.H. degrees, and eligibility for medical licensure in Oregon. Salary $13,200 a year to start. Write to Mr. A. T. Johnson, Personnel Director, Oregon State Board of Health, P. O. Box 231, Portland 7, Ore.

District Health Officer—Public health administrator of a district area; district epidemiologist. Plan, organize, supervise work of professional staff consisting of engineers, nurses, sanitarians, nutritionists, dental hygienists, health educators, and social workers. Requires M.D. and M.P.H. degrees and license to practice medicine in Wisconsin. Salary: starting rate $1,006, $1,131, or $1,256 per month, depending on training or experience which can be credited toward board certification in public health. Civil service, vacation, sick leave, Social Security, retirement, group health and life insurance benefits, travel allowance. For applications and further information write R. J. Siesen, Personnel Officer, State Board of Health, State Office Bldg., Madison 2, Wis.

Public Health Nurses—Generalized service in semirural area in the heart of the Redwood Empire on northern California's Pacific Coast. Year-round sports and recreation area; mild climate. Salary $439-$549 in four years. Thirty-seven and one-half-hour week. Car furnished. Requires approved PHN preparation. Experience desirable, but not essential. Write Director of Nursing, Hamboldt-Del Norte County Health Department, 805 Sixth St., Eureka, Calif.

Public Health Nurse—to perform field and clinical work for the city of Pasadena, Calif. Salary $494-$602 per month. Excellent working conditions and liberal benefits. Requires R.N. and PHN from the state of California. Direct inquiries to Personnel Director, Pasadena City Hall, 100 North Garfield Ave., Pasadena, Calif.

Public Health Nursing Supervisor—Professional supervision for a staff of eight, all fully qualified; participation in program planning and evaluation. Nonofficial association, generalized service, close cooperation with the director of health and staff. Student program starting 1962. Active board of directors. Liberal personnel policies. Located ten miles from Yale University. Salary open. Write Sarah M. Ferguson, R.N., M.P.H., Director, Hamden Public Health and Visiting Nurse Association, Inc., Town Hall, Hamden 18, Conn.

Maternal and Child Health Nursing Consultant—Position with the State of Hawaii Department of Health, Bureau of Maternal and Child Health. Requires five years' nursing experience, of which three years must have been in public health nursing and involv-

ing one year of teaching or supervisory responsibility; graduation from nursing school and college; completion of a college program in public health nursing; and graduate study in obstetrical and/or pediatric nursing. Salary $6,156-$7,860 per annum. Write to Department of Personnel Services, State of Hawaii, 825 Mililani St., Honolulu 13, Hawaii.

Executive Director—Public Health Nursing Association. Own headquarters; 16-nurse staff; generalized nursing service. Administrative ability and M.A. degree desired. Salary open. Apply to Mrs. Fred P. Bamberger, Personnel Committee Chairman, 2906 Bayard Park Dr., Evansville, Ind.

Public Health Nurse—Challenging position in a Detroit suburb of 115,000 for one with experience and training in public health nursing. Salary $5,100-$5,862 per year. Submit résumé to the Personnel Department, City Hall, Dearborn, Mich.

Senior Public Health Nurse—for generalized public health nursing, Livingston County, Mich. Starting salary dependent upon qualifications. Opportunity for nurse interested in program development in rural area. County seat lies near large urban areas, University of Michigan, and Michigan State University. For further information please contact Judith I. Hubbel, R.N., Public Health Nurse, Livingston County Health Department, Court House Annex, Howell, Mich.

Public Health Nurse III (District Advisory Nurse)—Give guidance and counseling to all public health nurses in a multiple-county area regarding community organization and relationships, program planning, public health nursing technics, records, and reporting. Responsible for inservice education program for local public health nurses and evaluation of nursing services. B.S. degree with major in public health nursing and three years' generalized experience as a public health nurse. Special requirements: registration or eligibility therefor as a registered nurse in Wisconsin; certification or eligibility for certification as a public health nurse in Wisconsin. Salary range $6,072-$7,872. Civil service, vacation, sick leave, Social Security, insurance and retirement benefits. Write Ione M. Rowley, R.N., Director, Public Health Nursing, 119 Monona Ave., Madison 3, Wis.

Sanitary Engineer—for director of Sanitation Division of 17 personnel. Recent winner of the Samuel J. Crumbine Certificate of Merit, national award in food sanitation. City-County Health Department serving population of approximately 170,000. Must have B.S. degree in sanitary engineering and administrative experience. Under Social Security; salary $8,600, plus travel allowance. Contact Arnold W. Brockmole, M.D., Health Officer, 201 S. E. Third St., Evansville, Ind.

Sanitarian (Massachusetts Registered)—for Health Department, Plymouth, Mass. Full time. Starting salary $4,723; maximum $5,224 in five years. Position available December 1, 1961. Town pays half of health and life insurance plan. Town car available. Retirement program. Please give full statistics, qualifications, and references. Write to Health Department, Plymouth, Mass.

Sanitarian—Large midwestern hospital desires person to conduct research and training in environmental sanitation. Administrative ability required. B.S. or M.S. degree in public health or related field. Experience desirable. Please state your qualifications and current salary. **Box S-41,** Employment Service, APHA.

Chronic Disease Social Worker (Medical or Psychiatric)—Assist in development of a state-wide rehabilitation and home nursing care program emphasizing good team care of handicapped people, mostly elderly. Participate in planning and conducting training institutes on rehabilitation for nurses and other professional personnel with emphasis on psychological and social aspects of aging and chronic disease. Initiate and develop interest and cooperation by social and welfare agencies in the division's local programs for the aged and the chronically ill. Interpret to lay and professional groups the role and function of the social worker in comprehensive patient care. Desirable qualifications: master's degree, plus three years of pertinent experience. Salary starts at $6,912; maximum $8,952. Travel allowance, vacation, sick leave, retirement, group insurance plans. Write R. J. Siesen, Personnel Officer, State Board of Health, Madison 2, Wis.

Consultant, Psychiatric Social Work—Challenging opportunity for psychiatric social worker with child guidance clinic experience and professional maturity. Public health focus on primary prevention reaching all facets of everyday family and community living. Creative educational work with parents, lay persons, nurses, public health personnel, teachers, and others. Consultation and inservice procedures emphasized. Assignment to district public health team serving several counties. Experimental and pioneering attitude essential. Master's degree and several years' paid experience, including some in a standard community child guidance clinic. Salary $6,912-$8,952. Civil service benefits. J. L. Wardlaw, Jr., M.D., State Board of Health, Division of Child Guidance, Madison 2, Wis.

Clinical Psychologist—Challenging opportunity for clinical psychologist with child guidance clinic experience and professional maturity. Public health focus on primary prevention reaching all facets of everyday family and community living. Creative edu-

cational work with parents, lay persons, nurses, public health personnel, teachers, and others. Consultation and inservice procedures emphasized. Assignment to district public health team serving several counties. Experimental and pioneering attitude essential. Completion (except for dissertation) of academic requirements for Ph.D. in clinical psychology, supplemented by paid experience in standard three-member community child guidance clinic. If M.A., must have four years' experience, three of which have been paid, including some in community child guidance clinic. Salary $7,512-$9,732. Civil service benefits. J. L. Wardlaw, Jr., M.D., State Board of Health, Division of Child Guidance, Madison 2, Wis.

Medical Records Librarian—An unusual opportunity to set up a medical records system in a new dynamic Mental Health Center. Must be registered, and must be well trained and capable. Position available immediately. Starting salary $405-$492, depending on qualifications. Attractive fringe benefits and working conditions. Contact Personnel Director, Fort Logan Mental Health Center, P. O. Box 188, Fort Logan, Colo.

Health Educator—Male or female, with M.P.H. or equivalent experience, for city of 82,000 and county of 169,000 with active, respected public health program. Three colleges. Salary $5,760-$7,200, plus usual fringe benefits. E. F. Hersey, M.D., Director, Kalamazoo County Health Department, City Hall, Kalamazoo, Mich.

Health Educator (Experienced)—for well organized County Health Department in Michigan. Apply to **Box HE-99**, Employment Service, APHA.

Public Health Educator III—Initiate and develop school-community health education programs in a multicounty district. Desirable qualifications: M.P.H. degree, plus two years' experience in health education; sound working knowledge of principles of education and methods of teaching. Salary starts at $6,072; maximum $7,872. Travel allowance, vacation, sick leave, retirement, group insurance plans. Write R. J. Siesen, Personnel Officer, State Board of Health, Madison 2, Wis.

Public Health Educator (Dental Hygienist)—Assist in developing dental health programs for preschool and adult groups in a several county area. Coordinate dental health education activities with over-all health education program. College graduation, M.P.H. degree, and two years' experience. Licensure or eligibility for licensure to practice dental hygiene in Wisconsin essential. Salary: Public Health Educator III—start at $6,072, maximum $7,872. Public Health Educator II (without M.P.H. degree)—start at $5,712, maximum $7,212. Civil service, vacation, sick leave, Social Security, and retirement benefits. Write R. J. Siesen, Personnel Officer, State Board of Health, 400 State Office Bldg., Madison 2, Wis.

Dental Hygienist—for established dental health program in well equipped, modern health department. Salary range $4,320-$5,400 per year, plus liberal travel allowance. Write to J. H. White, M.D., Director, Weld County Health Department, P. O. Box 521, Greeley, Colo.

Director, Public Health Laboratory—M.S. degree with major in microbiology, minor in immunology, and five years' experience in a public health laboratory, or a Ph.D. from an accredited university and one year's experience. Excellent opportunity for a qualified applicant. Salary range $461-$564; upward revision being considered. Write to Civil Service Commission, 425 East State St., Rockford, Ill.

Virologist — Master's degree and two years' laboratory experience, including six months in virus lab. Starting salary dependent on qualifications. Range $500-$625. Contact Administrative Officer, State Board of Health, Helena, Mont.

POSITIONS WANTED

On Box Numbers, Address APHA at 1790 Broadway, New York 19, N. Y.

Executive Director—B.S., M.A., ten-year background as executive director of state professional society in health field. Experienced in administration, public relations, convention management, legislative work, and community integration. Will relocate. Write **Box C-60**, Employment Service, APHA.

BOOK REVIEWS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

GUIDE TO A COMMUNITY HEALTH STUDY (2nd ed.)—American Public Health Association. New York, N. Y.: (The Association, 1790 Broadway), 1961. 156 pp. Price, $2.50.

The APHA Committee on Public Health Administration has had the courage to change with changing conditions and kept aware of timeliness. So much has happened in so many ways during the 40 odd years since the early steps were taken for appraisal in the United States! Changes still occur, as illustrated in this second edition of the Guide, besides the removal of "bugs," the reduction of adjectives, and the improvement in printing and readability—the latter especially pleasing to the National Society for the Prevention of Blindness.

These 156 pages are packed with constructive, stimulating ideas for all concerned. Those who participate in community studies, as the committee on preparation of the Guide hopes, optimistically, will find new approaches to the evaluation process, even to possible clues to attitudes, perhaps. How to make the best use of available resources, and of new or different facilities, may be suggested. The inspiration and pleasure of partnership in exploring community requirements and services will come with action under wise leadership.

Leading questions cause those who use the Guide to think of quantity, quality, interpretation, opportunity, and understanding of those who serve, and are served, and of others. "We," "our community life," "your plans for follow-up" are terms included by the 60 or more people who helped to improve the first edition of this document.

Typographical errors, overspecialized words and terms, cumbersome sentences are few. References to the 1951 local and the 1954 state descriptions of services and responsibilities suggest another job of revision for an APHA committee, especially as the footnote refers to standards and objectives. Among groups to assist in the use of the Guide, can women's auxiliaries and church groups be included more often, as well as the Junior Leagues, among others? Are we overlooking private schools, except for "parochial" schools?

But these are minor details to remind us that we are people who are dealing with people for people. Those who have done this excellent job deserve praise and gratitude. Wide use of this valuable "tool" is anticipated.

IRA V. HISCOCK

PROCEEDINGS OF A SYMPOSIUM ON IMMUNIZATION IN CHILDHOOD—Baltimore, Md.: Williams and Wilkins (428 East Preston St.), 1960. 139 pp. Price, $4.25.

This is a well edited summary of a lively discussion of problems relating to immunization in childhood in which representatives of all interested segments of the British medical profession participated. Among the major topics for discussion were: provocation poliomyelitis or poliomyelitis following injections; hazards of pertussis vaccination; faults in the sterilization of syringes and needles; immunization against poliomyelitis, pertussis, diphtheria, and tetanus; the use of combined immunization procedures; and recording of immunizations. The discussions led up to the development and adoption of two immunization schedules, Schedule A for those who prefer to limit the number of combined immunizations, and Schedule B

for those using triple vaccine (diphtheria, tetanus, and pertussis). The use of quadruple vaccine, incorporating poliomyelitis vaccine with the triple vaccine, was mentioned in the discussions but not included in any recommended immunization schedule.

The British Schedule B differs in some respect from the one advised in the APHA's "Control of Communicable Diseases in Man." The British recommend that the initial two poliomyelitis vaccinations be given at 7-10 months of age, whereas the APHA recommends that they be started as early as two months of age. The recommended interval between the second and third doses is about the same under the two schedules. The British group stated that there was no doubt concerning the necessity for a fourth dose of poliomyelitis vaccine, but it could not decide on the proper timing for this dose.

The British do not place the same emphasis upon vaccination against smallpox in early infancy as is done in the United States. On the contrary, they recommend smallpox vaccination during the preschool period, since extensive British data for the period 1951-1957 indicate that generalized vaccinia and postvaccinal encephalitis were reported at considerably higher rates in the group vaccinated under one year of age than in the 1-4-year-age group. A major difference lies in the British recommendation for routine immunization with BCG vaccine at 10-15 years of age, in contrast to American usage in restricting BCG vaccine to special situations. It is of interest to note that the British are now convinced of the efficacy of pertussis immunization.

This book is highly recommended to those who wish to gain an over-all view of British studies in the immunization field and those who wish to acquire some insight into the background of British thinking regarding immunizations.

EDWARD R. SCHLESINGER

SOCIAL WELFARE ADMINISTRATION— Edited by Ella W. Reed. New York, N. Y.: Columbia University Press (2960 Broadway), 1961. 121 pp. Price, $2.25.

This brief volume contains eight selected papers which were given at the 1960 National Conference on Social Welfare. The essays cover a broad range of topics relevant to social welfare administration as indicated by the following titles: "Methods of Agency Self-Examination," by Sol Morton Isaac; "Common Elements in Administration," by James D. Thompson; "The Administrative Process in a Social Welfare Agency," by Sue W. Spencer; "Organizational Preconditions for Research," by David G. French; "The Margin of Malleability," by Richard F. Cleveland; "The Human Aspects of Administration," by L. J. Ganser; "Approaches to the Study of Professional Practice," by John C. Flanagan; and "Selection and Staff Placement of Personnel," by Sidney Berengarten.

Practitioners in social welfare have often been criticized for taking refuge in platitudes and failing to establish criteria for evaluating the impact of their organizational efforts. In this respect, the tenor of these essays is indeed salutary. There is a strong plea to make the intended products of social welfare agencies explicit and, even more, to establish empirical criteria by which agencies may assess their effectiveness. Granting the unique characteristic of social welfare organizations, they have much in common with other kinds of organizations, and the findings and concepts of administrative science have as much meaning for the field of social welfare as for business or education. The potential contribution of research is well appreciated, and there is intelligent consideration of how basic and applied research might be utilized to benefit the social welfare profession.

The essays are clear, interesting, and provocative and should prove useful to teachers and practitioners of social wel-

fare. In addition, workers in related fields and professions will be heartened by the strong research orientation which runs through the book. SOL LEVINE

THE SICKNESS SURVEY OF DENMARK 1951-1954—Text by Marie Lindhardt. Published by the Committee on the Danish National Morbidity Survey. Copenhagen, Denmark: Munksgaard, 1960. 262 pp.

Those contemplating a morbidity survey can learn much from the problems encountered and the solutions developed by the Danish Committee in its house-to-house survey of the sickness experience among its adult population not admitted to hospitals at the time of interview. The purpose of this project was to chart the diseases and morbid conditions, including dental morbidity, within a representative sample of those age 15 and over and to learn what groups are liable to various forms of illness in relation to age, sex, residence, occupation, economic status, certain habits, and other relevant factors. This report, based on 87,000 respondents (somewhat less than 3 per cent of the adult population) supplements that of a related survey among hospitalized cases published by the same committee in 1958 under the title, "The Hospital Survey in Denmark."

The report compares the current Danish methods with those of previous efforts within its own borders and of nation-wide surveys in four other countries: Great Britain (the principal model for the Danish project), the United States, Canada, and Ceylon. Reports of the recent Japanese experience have not appeared in translation. The Danish Committee concludes that because of differences in methodology, comparison of results of these various surveys is not possible. Difficulties in defining the concept of sickness seem to be the chief explanation.

The Danish survey depended upon the respondent's definition of sickness as recorded by a staff of trained interviewers. Compared with known diagnoses in a subsample of 6,500, the people's ideas of their ailments coincided reasonably well with medical judgment.

Although the Danish data received careful statistical treatment, in a few instances more treatment than the data seem to merit, e.g., the common cold, the report does give full consideration to possible sources of error in the interpretations and conclusions. Nevertheless, the committee believes that the survey has covered a fairly representative sample of the adult population, and the results have provided valuable information on morbidity and its relation to social conditions.

Readers with morbidity and survey interests will, I believe, agree with the committee's conclusion.

LESLIE W. KNOTT

SALARIES AND WORKING CONDITIONS OF SOCIAL WELFARE MANPOWER IN 1960—A survey conducted by the U. S. Department of Labor, Bureau of Labor Statistics, in cooperation with the National Social Welfare Assembly, Inc., and the U. S. Department of Health, Education, and Welfare. New York, N. Y.: National Social Welfare Assembly, Inc. (345 East 46th St.), 1961. 130 pp. Price, single copy $1.75; quantity rates available.

This 1960 nation-wide survey of full-time employees carrying on welfare activities in social welfare agencies supplements a similar study in 1950 ("Social Workers in 1950") except that recreation workers are included in the current report.

Sixty-three tables and numerous charts interpret and compare narratively the conditions in 1950, and include the number, age, sex, marital status, distribution among governmental and voluntary programs, levels of positions held, and specific services such as casework, group work, recreation, as well as educational qualifications, salaries, fringe benefits, and geographic spread.

The data are of regional and national

significance, but are not of specific help in adopting personnel practices in comparison with other agencies within recruitment range. The data provide essential information to those who want current pertinent facts about social welfare personnel in general.

Helpful features, in addition to the interpreted data, are the description of the scope and method of the survey, lists of types of agencies employing social welfare personnel, and the types of positions included and excluded from the survey.

Separate reports will be published by the Bureau of Public Assistance and the Children's Bureau for public assistance and child welfare workers, and by the Public Health Service for employees engaged in the administration of public health programs, including maternal and child health, crippled children and community health.

Data have been coded and punched on cards and it is possible that specific needs for information could be produced were it wanted.

CHARLES B. FRASHER

SOCIAL SECURITY: PROGRAMS, PROBLEMS AND POLICIES—Selected Readings by William Haber and Wilbur J. Cohen. Homewood, Ill.: Richard D. Irwin, 1960. 606 pp. Price, $8.75.

Professors Cohen and Haber have performed a useful service to teachers and students of Social Security by producing a second volume of their well known "Readings in Social Security," first published in 1948. In the intervening 13 years, programs have proliferated while books, special studies, reports, official and otherwise, and technical articles have enormously increased in number. Hence the problem of selection has become increasingly difficult. Inevitably every reader will judge the present volume by his own interests and needs, and criticism is more likely to be directed to that which is omitted than to the inclusions. Each section is, however, enriched by a list of additional selected references.

The title is somewhat misleading for, in fact, it concentrates very heavily on social insurance rather than on the entire field of Social Security. The material on public assistance is particularly weak. There are not even any excerpts from the important Federal Advisory Council on Public Assistance of 1960. Similarly, the section on Medical Care concentrates on health insurance and gives little or no representation to comprehensive health programs, medical care as administered by public welfare agencies, or even, for that matter, Medicare or the Veteran's medical services. It is also unfortunate that the book was undoubtedly completed before the many special issues of professional journals celebrating the 25th anniversay of the Social Security Act were available. Thus, they print Christgau's 1955 article on OASI rather than his more up-to-date paper of 1960.

It is surprising, on the part of two authors whose devotion to the public programs is well known, that in a volume which claims to present the important viewpoints mirroring major lines of reasoning, while the views of many critics of social security are presented at length, no place is found for any reproduction of the views of organized labor, or of such active proponents of public action as the American Public Welfare Association or the National Association of Social Workers. Furthermore, in view of the space devoted to Dillard Stoke's critique of the financing of OASDI, it would have been helpful to have reproduced one of Robert Myer's reports to Congressional Committees on the actuarial aspects of the program or one of the Committee Reports or one of Cohen's own articles on the legislative history of major amendments which reveal so well to students the careful consideration that is given by the legislators

to the financial aspects of proposed changes. This reviewer's experience has been that this type of material is much more useful for teaching than the Report of the Advisory Council on Social Security Financing, which is quite properly printed in this volume.

Perhaps the most serious criticism to be made of the "Readings" is that the authors fail to indicate, in many cases, at the head of each excerpt its exact source and whether it is a complete or an abridged version of the article or chapter, or even whether the material is available in print or only in mimeographed form. EVELINE M. BURNS

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ADMINISTRATION OF COMMUNITY HEALTH SERVICES. Prepared in consultation with the Committee on Public Health Administration of the American Public Health Association and a Special Advisory Committee. Edited by Eugene A. Confrey. Chicago, Ill.: International City Managers' Association, 1961. 560 pp. Price, $7.50.

CURRENT PROBLEMS IN ELECTROBIOLOGY. Annals of New York Academy of Sciences. Vol. 94, Art. 2. Dominick P. Purpura, et al. New York, N. Y.: The Academy, 1961. Pp. 337–654. Price, $3.50.

ELEMENTARY TEACHERS GUIDE TO FREE CURRICULUM MATERIALS. 18th Annual Edition 1961. Randolph, Wis.: Educators Progress Service, 1961. 346 pp. Price, $7.50.

FINANCIAL ASSISTANCE AVAILABLE FOR THE GRADUATE STUDY IN MEDICINE (6th ed.). Evanston, Ill.: Association of American Medical Colleges, 1961. 197 pp. Price, $3.

HEALTH AND FITNESS IN THE MODERN WORLD. A Collection of Papers Presented at the Institute of Normal Human Anatomy and the Ministry of Foreign Affairs, Rome, Italy. Chicago, Ill.: Athletic Institute, 1961. 400 pp. Price, $4.50.

HEALTH MANPOWER SOURCE BOOK. Section II-Medical School Alumni. William H. Stewart and Maryland Y. Pennell. Washington, D. C.: Gov. Ptg. Office, 1961. 316 pp.

ICE CREAM AND RELATED PRODUCTS. J. H. Frandsen and W. S. Arbuckle. Westport, Conn.: Avi Publishing Co., 1961. 372 pp. Price, $10.50.

MEDICINE SHOW—Some Plain Truths about Popular Remedies for Common Ailments. Editors of Consumer Reports. New York, N. Y.: Simon and Schuster, 1961. 250 pp. Price, $3.95.

MUNICIPAL REFUSE DISPOSAL. Committee on Refuse Disposal, American Public Works Association. Chicago, Ill.: Public Administration Service, 1961. 522 pp. Price, $8.

NURSING HOME ADMINISTRATION. John D. Gerletti; C. C. Crawford; and Donovan J. Perkins. Downey, Calif.: Attending Staff Association, 1961. 472 pp. Price, $6.50.

PERCEPTUAL CHANGES IN PSYCHOPATHOLOGY. Edited by William H. Ittelson and Samuel B. Kutash. New Brunswick, N. J.: Rutgers University Press, 1961. 262 pp. Price, $9.

PHYSIOLOGIE HUMAINE—Cellulaire et Organique. H. Laborit. Paris, France: Masson et Cie, Libraires de l'Academie de Medecine, 1961. 586 pp.

PSYCHOPATHOLOGY OF AGING. Edited by Paul H. Hoch and Joseph Zubin. New York, N. Y.: Grune and Stratton, 1961. 321 pp. Price, $9.75.

SEROLOGY OF CONGLUTINATION AND ITS RELATION TO DISEASE. R. R. A. Coombs; Anne M. Coombs; and D. G. Ingram. Springfield, Ill. Thomas, 1961. 210 pp. Price, $9.

SHORT MANUAL OF VENEREAL DISEASES AND TREPONEMATOSIS. R. C. L. Batchelor and Marjorie Murrell. Baltimore, Md.: Williams and Wilkins, 1961. 316 pp. Price, $6.

SOCIAL INSURANCE—Some Problems for Statistical Research. Papers presented at the Annual Meeting, American Association for the Advancement of Science, 1960, under the sponsorship of the New York Area Chapter

of the American Statistical Association. Edited by Lincoln H. Day. New York, N. Y.: Columbia University, Bureau of Applied Social Research, 1961. 71 pp.

STATESMAN'S YEARBOOK 1961-1962. Edited by S. H. Steinberg. New York, N. Y.: St. Martin's Press, 1961. 1,720 pp. Price, $9.50.

SYNOPSIS OF PUBLIC HEALTH AND SOCIAL MEDICINE. A. J. Essex-Cater. Baltimore, Md.: Williams and Wilkins, 1960. 563 pp. Price, $11.

TEACHING YOUR CHILD RIGHT FROM WRONG. Dorothy K. Whyte. New York, N. Y.: Bobbs-Merrill, 1961. 192 pp. Price, $3.50.

TOADSTOOL MILLIONAIRES. A Social History of Patent Medicines in America Before Federal Regulation. James Harvey Young. Princeton, N. J.: Princeton University Press, 1961. 282 pp. Price, $6.

TRAITOR WITHIN. Our Suicide Problem. Edward Robb Ellis and George N. Allen. New York, N. Y.: Doubleday, 1961. 237 pp. Price, $3.95.

TRUTH ABOUT THE NEW BIRTH CONTROL PILLS. John Devaney and Philip Reaves. New York, N. Y.: Popular Library, 1961. 126 pp. Price, 50 cents.

UNIT OPERATIONS OF SANITARY ENGINEERING. Linvil G. Rich. New York, N. Y.: Wiley, 1961. 308 pp. Price, $10.75.

VOLUNTARY MEDICAL INSURANCE IN CANADA 1958. Summary Data. Research and Statistics Division. Health Care Series No. 13. Ottawa, Canada: Department of National Health and Welfare, 1961. 92 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Raymond S. Patterson, Ph.D., F.A.P.H.A.

Healthy School-Agers — During the decade ending 1959 mortality from all causes declined by about a third for school-age children from 5 to 14 years old. Accidents still took a toll of more than 6,500 children's lives though the record even here improves. The accidental deaths were more than two and a half times the number of cancer deaths—the second leading cause in this age group. Children run-over or hit while playing on the streets were the chief accident victims. In both these papers the tabulations are well worth your thoughtful study.

ANON. Health of the School-Age Population (and) Accident Hazards at the School Ages. Statist. Bull. Metrop. Life Insur. Co. 42,8:1 (Aug.), 1961.

Suburban Sprawl (Continued)— Marked suburban growth has gone on all through the decade of the 50's in the "Standard Metropolitan Statistical Areas." It was highest in the Pacific States and least in the New England States. For the second successive decade the population of Miami and its environs increased about 160 per cent. In only a few SMSA's were central city gains greater than their suburbs: Phoenix led in this respect but Dallas, Houston, San Antonio, and the Tampa-St. Petersburgh combination also made such a record. The sanitary and health administrative problems created by suburban sprawl are widely understood by us but they are dramatically pinpointed here.

ANON. Suburban Population Increasing Rapidly. Statist. Bull. Metrop. Life Insur. Co. 42,7:1 (July), 1961.

About British Babies—Introducing a series of papers about maternity and child health, published in a special issue of the journal of the (Br.) Society of MOH, an editor writes: "The child health services of the local authorities have been under critical fire from the outside virtually since their inception. In the beginning they were 'encroachments' on the work of others, later they became 'a deplorable waste of time and money' and today the fashionable word would seem to be 'anachronistic.' Criticism from within has received less publicity but it certainly exists and has had no little effect." Have comparable services on our side of the water had, and survived, such criticism? If so, these half dozen papers must have meaning and interest for us.

ANON. Taking Stock. Pub. Health 75, 6:321 (Sept.), 1961.

Success Story—No matter how distant your professional interests may be from environmental sanitation you could not but be impressed by this factual account of the tremendous job of organizing and carrying out sanitary safeguards for more than 56,000 campers at the camp site and in transit to and from the camp—in 68 special trains, 28 regular trains, and 600 buses. No case of illness attributable to sanitation-related conditions was recorded. A man-size job if ever there was one!

BULLIUNG, M. Boy Scout Jamboree Sanitation. The Sanitarian 24,1:18 (July-Aug.), 1961.

Better Polio Vaccine—It is reported here that there is now available a purified, concentrated polio vaccine giving standard optimal quantities of antigen (without any nonviral antigens) and employing a relatively nonvirulent substitute for the Type 1 Mahoney strain.

CHARNEY, J. C., et al. Development of a Purified Poliomyelitis Virus Vaccine. J.A.M.A. 177,9:591 (Sept. 2), 1961.

Interim Report—British researchers seem to be finding more penicillin-resistant strains of gonococci than do our VD experts. The conclusion of this committee study is that the present situation gives cause for concern but not alarm (because there is little current evidence that such resistant strains exceed the highest levels reported by the committee a few years earlier). However, there is need for maintaining a continuous survey.

FAIRBROTHER, R. W., et al. Resistant Strains of Gonococci to Penicillin. Lancet 7196:226 (July 29), 1961.

Preventing Measles—A good word is said here for the prophylaxis of measles via the attenuated virus vaccine route. Only one in ten treated children had malaise similar to mild natural infection; the others carrying on as usual. Complications were rare and vaccination was generally acceptable to parents and their physicians.

KARELITZ, J., et al. Measles Vaccine. J.A.M.A. 177,8:537 (Aug. 26), 1961.

Planned Waters—What must be the all-time bottom of understatements is this: "Providing safe and reliable water supplies on the moon will not be an easy task." It is from a stimulating speculation entitled "Water Supply on the Moon" and it follows a more mundane discussion of our American water problems here and now. That paper, by the U. S. Senator from Arizona, who must have good reason to understand the imperative need for a strong national program of water management, outlines graphically our present water resources and withdrawals, and the growing shortages that must surely happen if we do not take action now.

KERR, R. S. Planning for National Water Needs. J. Am. Water Works A. 53,9:1081 (Sept.), 1961.

Nonpolio "Poliomyelitis" — In Scotland, in 1959, a number of patients —some with paralysis—were sent to hospitals with a provisional diagnoses of "poliomyelitis" or "meningitis," but from none could a poliovirus be isolated. Virologic study produced a number of agents in which Coxsackie virus predominated. Virtual disappearance of poliovirus infections in 1958 following widespread use of Salk vaccine was noted. What effect it may have had on this unusual epidemic is discussed.

LANDSMAN, J. B., et al. Poliomyelitis-like Disease in 1959. Brit. M. J. 5252:597 (Sept. 2), 1961.

Formula Fixers—This quotation is part of an editorial introduction: "Now relax with Levin and enjoy this beautiful essay. Be a bit humble as you read of the painful and halting steps which had to be taken the world over before infant feeding could be taken for granted by many. The author does not exaggerate." Truly, it is a beautiful essay, as the editor promises, but it is distressing too. Try it!

LEVIN, S. Infant Feeding as a Faith. A.M.A. Am. J. Dis. Child 102,3:380 (Sept.), 1961.

Progress in Hepatitis—Improved tissue-culture methods have permitted more successful cultivation of hepatitis virus. Together with new filtration and electron-microscopic technics, these may all become better tools for the production of vaccines. Steady increases in reported cases of infectious hepatitis make more imperative better diagnostic and prophylactic measures.

RICHTSEL, W. A., et al. Status Report on Tissue-Culture Cultivated Hepatitis Virus. J.A.M.A. 177,10:671 (Sept. 9), 1961.

Another New Tool—As a new technic, fluorescent antibody is beginning to alter the laboratory diagnoses of certain viral disease. Even though it was first proposed and described two decades ago it is still so new that it will be some time before it finds its way into the virology textbooks, so it is not surprising if you say that it is "all Greek" to you. In this paper you will find a clear description of the ways this "rapid diagnosis" method may be applied to primary atypical pneumonia, streptococcal pharyngitis, herpes simplex, and rabies.

SHEPARD, C. C. New Diagnostic Techniques in Viral Infections. GP 24,3:110 (Sept.), 1961.

Hardy Perennials—Two ever-recurrent topics in the area of school health are reviewed again. The first paper—about education against alcohol —points out that almost all efforts are directed toward total abstinence, suggesting that drinking is inherently sinful, whereas over 65 per cent of all adults drink, the highest percentages being in the 21-to-50-year groups where strongest identification with high school students occurs. A psychologically sounder objective is offered. The second paper—about sex education—outlines a "going" program as it is carried out in San Diego (Calif.). These discussions must surely interest more than just our school health members.

SHIMMEL, G. M. Content and Method in Controversial Areas (and) Wetherill, G. G. Sex Education in Public Schools. J. School Health 31,7:230 (Sept.), 1961.

Smokers' Hearts — Based upon initial examinations and interviews of ethnically similar men whose smoking habits were recorded, a prospective study was made of relationships between cigarette consumption and heart disease. Suggestive evidence was unearthed implicating heavy cigarette smoking in the precipitation of acute myocardial infarction in atherosclerotic individuals and no such association was observed in cigar or pipe smokers.

SPAIN, D. M., AND NATHAN, D. J. Smoking Habits and Coronary Atherosclerotic Heart Disease. J.A.M.A. 177,10:683 (Sept. 9), 1961.

Another Good Word—About 600 children were included in a controlled study of attenuated measles vaccine given immediately before immune globulin. Temperatures of 101 to 104 occurred in a portion of the vaccinees but this was unaccompanied by significant clinical reactions. All vaccinees were protected against natural infection upon intimate exposure.

STOKES, J., Jr., et al. Efficacy of Live, Attenuated Measles Virus Vaccine Given with Human Immune Globulin. New England J. Med. 265,11:507 (Sept. 14), 1961.

New PHN Job—Two exploratory projects (in Baltimore and Pittsburgh) are reported upon in which public health nurses worked out ways to give home nursing help to the mentally ill after hospital discharge, and guidance to their families during, and after, the patient's hospitalization. Effective collaboration between hospital staffs and public health nursing services was the key to whatever successes were achieved.

TURNER, E., AND SCALLY, A. L. Home Services for the Mentally Ill (and) FLEMING, R., et al. An After-Care Program for Patients Discharged from Mental Hospitals. Nursing Outlook 9,9:541 (Sept.), 1961.

Breast Cancer—These sentences are lifted from the introduction to a discussion of the current status of breast cancer mortality, ". . . which has improved but slightly in the last twenty-five years." "The absolute survival rate of patients . . . in this country and abroad ranges between 30 and 40 per cent." "Despite the limitations of our present means of diagnosis and treatment, their complete utilization . . . (would be) capable of increasing the over-all five-year survival rate to about 60 per cent." Epidemiology, anatomy, and diagnosis—including self-examination and periodic mammography—are reviewed. Part 2 is promised.

URBAN, J. A. Current Trends in Breast Cancer Treatment. Part I. New York State J. Med. 61,18:3120 (Sept. 15), 1961.

If additional information is desired regarding the articles listed in this bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

A.M.A. Am. J. Dis. Child (American Journal of Diseases of Children), American Medical Association, 535 North Dearborn St., Chicago, Ill.

Brit. M. J. (British Medical Journal), British Medical Association House, 19 Tavistock Sq., London, W.C.1, England.

GP (General Practitioner). The American Academy of General Practice, Volker Blvd. at Brookside, Kansas City 12, Mo.

J. Am. Water Works A. (Journal of the American Water Works Association), 2 Park Ave., New York, N. Y.

J.A.M.A. (Journal of the American Medical Association), 535 North Dearborn St., Chicago, Ill.

J. School Health (The Journal of School Health), American School Health Association, 515 East Main St., Kent, Ohio.

Lancet, 7 Adams St., Adelphi, London, W.C.2, England.

New England J. Med. (New England Journal of Medicine), Massachusetts Medical Society, 8 The Fenway, Boston 15, Mass.

New York State J. Med. (New York State Journal of Medicine), 750 Third Ave., New York, N. Y.

Nursing Outlook, American Journal of Nursing Company, 2 Park Ave., New York 16, N. Y.

Pub. Health (Public Health), Society of Medical Officers of Health, Tavistock House, Tavistock Sq., London, W.C.1, England.

Sanitarian (National Association of Sanitarians), University of Denver, UPC, Department of Sanitary Science, Denver 10, Colo.

Statist. Bull. Metrop. Life Insur. Co. (Statistical Bulletin of the Metropolitan Life Insurance Company), One Madison Avenue, New York 10, N. Y.

CREDIT LINES

The Journal cannot furnish copies of items mentioned in Credit Lines. Please send requests to the addresses given.

A Facility for Prevention

A Suicide Prevention Center, located on the grounds of the Los Angeles County Hospital, has been in operation since 1958, supported by a five-year project grant from the Public Health Service. It was established for the evaluation, referral, treatment, follow-up, and over-all prevention of suicidal behavior.

The center has three primary goals, the first of which is to save lives. The staff makes psychiatric, psychological, and sociological evaluations of persons in the midst of a suicidal crisis, and then either treats or refers them to a community agency or private clinic.

The second goal is to show that such a center can play a vital role in the health and welfare activities of a large metropolitan community and can establish itself so that the community will eventually wish to maintain and support it.

The third goal is to collect and collate heretofore unavailable data regarding suicidal phenomena and to use this information to develop and test hypotheses concerning suicide. It is felt that this procedure will lead to more accurate predictions of attempted suicides, and, hopefully, will lead ultimately to lower suicide rates.

Liaison has been established with agencies in the community which deal with mental health problems, and over 50 social agencies have been contacted which might need to know of the existence of the center, or wish to use its consultative services.

The Suicide Prevention Center grew directly out of a recognized need to fill a gap in community resources. According to Edwin S. Shneidman, Ph.D., co-project director with Norman L. Farberow, Ph.D., "the fact that little organized community effort has been directed against suicide, and that there are few systematic preventive activities or research projects concerned with it, probably relates to the taboo nature of the topic. It is well known that other decimators, like tuberculosis, venereal disease, cancer—all of which were similarly tabooed until the bright light of treatment and research were focused on them—can now be diagnosed, treated, and prevented, unhampered by either hush-hush or neglect."

Among the suicide attempters seen by the staff are those who have been hospitalized in the Los Angeles County Hospital for medical treatment as a result of an attempt and individuals referred by community agencies and physicians. There are a certain number of self-referrals.

California's Health, July 1, 1961, issue, which tells more about this project, is available through the Bureau of Health Education, State Department of Public Health, 2151 Berkeley Way, Berkeley 4, Calif.

(In August, McGraw-Hill Book Company, 330 West 42nd St., New York 36, N. Y., published "The Cry for Help" which describes the activities of this center, and is edited and partly written by Drs. Farberow and Shneidman. Priced at $9.95.)

Wiping Out Bovine TB in Canada

The Canada Department of Agriculture, Health of Animals Division, Ot-

tawa, has published a series of news releases containing statistical and background material on the Dominion's program for eradicating bovine tuberculosis.

Systematic testing of Canadian herds began 38 years ago. As of June this year all herds in Canada had been brought into the eradication program. More than 49 million cattle have been tested since the program began. Of these, 576,000 were found to be infected. Incidence of the disease has now been reduced to an all-time low of 0.14 per cent.

R. J. McClenaghan, chief veterinarian for the Health of Animals Division, for details or the group of news releases.

New Medical Literature Index

Volume 1 of the Cumulated Index Medicus, covering literature indexed in 1960 in the monthly issues of Index Medicus, and published by the National Library of Medicine, may now be ordered from the American Medical Association. Listing approximately 125,000 articles, the volume is printed in three parts but the parts cannot be purchased separately. Part 1 is an index of authors and list of the medical journals covered; parts 2 and 3 are a subject index. Price for delivery in the United States, its possessions, and Canada, is $35. Orders (must be paid) to AMA Circulation Department, 535 North Dearborn St., Chicago 10, Ill.

The National Library of Medicine's Index Mechanization Project is extensively reported on for the period July, 1958-June, 1960 in the Bulletin of the Medical Library Association for January, 1961. The principal aim of the project has been to devise a system that would allow publication of an index of greater coverage, currency, and ease of preparation and use than had been possible with the old system for the "Current List of Medical Literature," a predecessor of the new Index Medicus, now cumulated in the Vol. I referred to above. Single numbers of the Bulletin, Mt. Royal and Guilford Aves., Baltimore 2, Md., for $1.75.

"New Careers in the Health Sciences"

Sponsored by the Commission on Health Careers of the National Health Council and prepared with the cooperation of the Public Health Service, the brochure "New Careers in the Health Sciences" is designed to reach high school science students who might not otherwise discover that health is an exciting field of career opportunity. Published under a grant from the National Science Foundation, this 20-page piece is being issued by the National Health Council.

The careers described are in the fields principally of biology, chemistry, engineering, mathematics, and physics. Some idea of what is covered is seen in one of its paragraphs.

"Working shoulder to shoulder with the physician, the surgeon, and the biologist are: the biophysicist . . . the biochemist . . . the physical biologist . . . the physical chemist . . . the nuclear physicist . . . the geneticist . . . the bacteriologist . . . the virologist . . . the molecular biologist . . . the pharmacologist . . . the radiologist . . . the mathematician . . . the epidemiologist . . . the electronic computer expert . . . engineers in all their many health-science specialties . . . and lots of others."

The brochure makes a special point of the fact that only a fraction of the careers in health are in the scientific disciplines under discussion, noting that there are more than 150 different occupations in the health field. Some of these are listed, following which an excellent summary of other kinds of health work is presented.

This recruiting tool manages admirably to combine professional approach

with informal appeal and may very likely generate some solid enthusiasm among its intended readers. Persons well into their professional careers might also find its material useful in their own personal campaigns to urge young people to dedicate themselves to work in the health sciences.

Special information on availability from Health Careers Program, National Health Council, 1790 Broadway, New York 19, N. Y.

Tool for Studying Rural Health

As noted in the introduction to "Rural Health: Selected Annotated References, January, 1953-June, 1960," "The growth of medical specialization and the increasing importance of hospital facilities have been accompanied by the concentration of medical services in urban areas where accessibility to large populations and specialized resources is greatest." One effect of all this has been to place the rural population at a relative disadvantage in obtaining adequate health services.

This reference list aims to facilitate the use of resource materials by social researchers and other workers interested in rural health problems and activities. References are organized under seven major headings: Trends Affecting Rural Health (including demographic changes); Health Status; Health Resources and Their Utilization; Personal Health Care Expenditures and Financing; Social Factors Affecting Use of Health Resources; Community Study and Action Programs; and Special Population Groups, including Agricultural Migrants.

Compilers are Elsie S. Manny, Economic Research Service, U. S. Department of Agriculture, and William G. Yanniello and Helen L. Johnston, Division of Community Health Practice, Public Health Service. Miscellaneous Publication No. 860, Government Printing Office, Washington, D. C. Price not listed.

Usefulness of Booklet on Stroke

The Public Health Service published "Strike Back at Stroke," in 1958, as an aid to the practicing physician in prescribing effective restorative treatment that can be carried out in the home following a cerebral vascular accident.

A study conducted under the auspices of the Kentucky State Department of Health has now been made of physicians' opinions on the effectiveness of this booklet. Precisely, the study was to evaluate the actual and potential usefulness of the booklet in private practice and to see if usage of the booklet was related to the way it was delivered.

Some 150 Kentucky physicians were chosen to receive the booklet by four different methods—distribution by direct mail, hand delivery, at medical society meetings, and by public health nurses who knew of physicians caring for stroke patients.

Physicians are reported to have found the booklet "extremely useful." For example, it has helped many patients to attain self-care. For details see "Report of a Study on 'Strike Back at Stroke'" by William B. Parsons, Blaise Favara, M.D., and Merle Lichtefeld, M.P.H., respectively project coordinator, and medical and statistical consultants. They have been on loan from the Public Health Service to the KSDH, Frankfort, Ky., through which agency the report may be available at least in limited supply.

Yardsticks: Nursing Administration

Many of the 16 "Criteria for Evaluating the Administration of a Public Health Nursing Service," a statement by the National League for Nursing, are limited to "high level" assumptions. Some of these are that the health of the people in an area will benefit by having

a well qualified professional staff which uses service records and helps with community health and welfare planning. The balance of the criteria are devoted to matters of administrative good housekeeping. An agency meeting these criteria would no doubt have a program exercising a constructive effect on the health of the citizens.

The statement is attractively arranged and succinctly stated. Each of the criteria is given "Amplification" and "References." Published by NLN, 10 Columbus Circle, New York 19, N. Y., "as one means of fulfilling the League objective of improving public health nursing"; 25 cents.

Child Health: A Community's Concern

In order to promote programs of continuous health supervision for all children from birth through the school years throughout the nation, the National Congress of Parents and Teachers has conducted pilot projects in several states to gather information for developing a plan of work which would be helpful to states, cities, or communities in setting up similar programs.

Georgia was one of the states selected for these pilot projects, and during the 1960-1961 school year five such studies were conducted in Blakely, Muscogee County-Columbus, Bartow County-Cartersville, Atlanta, and Savannah.

When the survey was complete, an evaluation committee met to determine the value of certain health practices in the community. This evaluation committee was composed of representatives from the local health department, local PTA, school administration, PTA county council, local dental association, local medical association, state and national PTA, and the state health department.

In hopeful anticipation of the constructive results of these studies, it was decided in the beginning that a step-by-step pictorial report of one of the projects should be made. The study in Savannah and its Juliette Low Elementary School was selected. Through the years this school had incorporated health information, instruction, and activities into its curriculum. In addition, there was a good working relationship already established between this school, the local health department, and the parents in the school area.

The story of the project conducted at this school has been put into booklet form by the Georgia Department of Public Health in cooperation with the Chatham County Department of Public Health in Savannah. This booklet, entitled "Better Health for All Children, a Community's Concern," is reported to be available upon request from the Health Education and Training Service, Georgia Department of Public Health, Atlanta.

NEWS FROM THE FIELD

WHO News

Americas: Health and Economic Growth

The portrait of health services in the Americas can be viewed from numerous vantage points through a reading of the 1960 Annual Report of the Director, Pan American Health Organization.

The director's introduction masterfully relates the intricacies of economic fact and social development in the Americas, principally Latin, to the planning and programing of health services there. Several events, which he describes, took place in the hemisphere in 1960 that lent "significant support to the doctrine of health as a basic component of economic development." These stimulated debates and interagency discussions on a wide scale which, in effect, have "made it possible to define concepts more accurately, to demarcate responsibilities, to break down compartmentalism, and to give due emphasis to the interrelationship between economic growth and social progress."

These clarifications are then discussed, the discussion acting in turn as the setting for the rest of the 155 page report which deals with PAHO's activities in public health administration, disease control and eradication, education and training, research and other aspects of its work.

This report is Official Documents No. 38, August, 1961. From Secretariat of PAHO, Pan American Sanitary Bureau, Regional Office of WHO, 1501 New Hampshire Ave., N.W., Washington 6, D. C. No price listed.

Services to Workers in Small Factories

A Conference on Health Services in Small Factories was convened jointly by the WHO Regional Office for Europe and the International Labour Organization (ILO) in Dublin, Ireland, May, 1961. The 40 participants in the conference came from 22 countries.

Between 80 and 90 per cent of factories in most European countries employ less than 100 workers. While the problem of providing health services in large factories in Europe is said to be well on the way to solution, most of the smaller factories do not have health services on or near their premises. Conferees were divided on how services to these factories should be provided. Present schemes for such services were discussed.

In eastern Europe they are provided as part of a general program of health protection organized by the state. In France, the Ministry of Labour obliges employers to set up health services which, for the majority of small factories, take the form of interfactory services. In Italy, health services in small factories are mainly the concern of the National Institute for the Prevention of Accidents and its some 30 branches. In the Netherlands, the United Kingdom, and Scandinavia, interfactory occupational health services (mainly preventive) are provided on a voluntary basis, generally by means of a nonprofit-making body on which doctors, employers, and workers are represented.

In a separate statement, the employers' representatives at the conference declared that health plans should be encouraged to provide more than preventive treatment but that services should be organized on a voluntary basis. Representatives of the workers' organizations welcomed the important developments now taking place in the field of health supervision, but many considered that progress in this field is still too

slow. It was their opinion that, by accepting the goal of occupational health services for all workers, the ILO has opened an important chapter in the history of occupational health.

A report in WHO Chronicle for September, 1961, is somewhat more detailed. Columbia University Press, 2960 Broadway, New York 27, N. Y. Single copies 30 cents.

Fellowships: American Health Workers

In 1962, the WHO will provide a limited number of short-term fellowships for the "improvement and expansion of health services" to American-citizen applicants engaged in full-time public health or educational work. A WHO Fellowship Selection Committee established by the Surgeon General will consider the ability of the applicant, the field of study proposed, and the contribution which foreign study will make on his return. Officers and employees of the United States government are not eligible. Fellowships cover per diem and transportation and are usually limited to short-term travel, i.e., from two to four months. Applicants' employers will be expected to continue salary during the fellowship. Applications must be in by January 1, 1962. Further information from Howard M. Kline, M.D., Secretary, World Health Organization Fellowship Selection Committee, Public Health Service, Washington 25, D. C.

From Half- to Quarter-Way House

It is said that many of the more than 300 alcoholic men released each month from the San Bruno jail, where San Francisco (Calif.) sends its alcoholics, usually return promptly to their former drinking habits and are convicted again and again for drunkenness. Most of them are near middle age, are not considered employable, and are often physically or mentally deteriorated. But this picture may be in for some changes.

The Division of Alcoholic Rehabilitation, California State Department of Public Health, has established a "quarter-way" house program, a rehabilitative venture for these men.

The goal is to assist about 50 men each month who have shown some insight into their personality problems and who have asked for assistance with their drinking problem.

The Northern California Service League, one of two agencies cooperating with CSDPH, arranges for the men's housing away from "skid row" and near employment centers for a period of two weeks. It also provides them with a small amount of money for cleaning and laundry bills, shaving materials, and for transportation to and from work. This arrangement differs from "half-way" house programs in which alcoholics who have already made some progress toward recovery may work and stay in a special residence for an indefinite period of time.

The Adult Guidance Center, which is the outpatient alcoholism clinic of the San Francisco Health Department, provides counseling and casework with the "quarter-way" men. A psychiatric social worker is at the residence half-time each day for personal consultation. The primary focus, however, is on obtaining employment.

The cooperating agencies believe that a high percentage of permanent employment for these men and a low rate of return to custody for drinking offenses would indicate that a "quarter-way" house program has merit.

CDC Combines Two VD Laboratories

The Communicable Disease Center of the Public Health Service has combined its two venereal disease laboratories into a single organization located at Chamblee, Ga. This has entailed the move of the Venereal Disease Experimental Laboratory from Chapel Hill, N. C.

Ad Harris, who has been with the Venereal Disease Research Laboratory since 1933, will serve as director of the combined laboratories. Dr. Wilbur E. Deacon and Dr. Joseph Portnoy will serve as assistant directors, the former heading services in microbiology research and the latter, immunology research and serologic services.

Requests for information and services should be addressed to Communicable Disease Center, Atlanta 22, Ga., Attention: Venereal Disease Research Laboratory.

BSC Reports on Certification

The Biological Stain Commission met for its 1961 session in Rochester, N. Y., in June, with representatives of 10 of the 15 sponsoring national societies in attendance. The Commission Laboratory reported that 105 stains submitted by seven companies had been examined in 1960, 97 of which were certified, and that 108,606 labels attesting certification had been issued. During the first six months of 1961, a total of 106 stains have been submitted for examination. A new Certification Committee is investigating the need for developing standards and certification procedures for important new staining agents including fluorescent dyes and histochemical reagents.

All 1960-1961 BSC officers were reelected for 1961-1962. They are: Dr. Ralph D. Lillie, president; Dr. Conway Zirkle, vice-president; Dr. Victor M. Emmel, secretary; and Dr. Elmer H. Stotz, treasurer. Dr. Edmund K. Kline is APHA representative to the BSC.

In Brief

The Public Health Service has selected February 13, 14, and 15, 1962, as the dates it will administer competitive examinations for officer appointment in the Regular Corps of the PHS Commissioned Corps. This set of examinations will be for appointments of medical officers, sanitarians, sanitary engineers, dentists, veterinary officers, and nurses. Complete details and application forms from Office of the Surgeon General, Public Health Service (P), Washington 25, D. C. Deadline for applications is January 5, 1962.

The Communicable Disease Center, Atlanta, is offering a three-week course in Epidemiology for Nurses, starting February 5, 1962. Experiences are provided professional nurses at all levels of nursing practice and nursing education to obtain additional skill in applying epidemiological technics in the prevention and control of disease. Information from Chief, Specialized Training Unit, Nursing Section, Epidemiology Branch, Communicable Disease Center, Atlanta 22, Ga. Deadline for applications is December 23, 1961.

The National Council to Combat Blindness finances research in ophthalmology and related sciences for the ultimate reduction of blinding eye diseases and ocular disorders. It yearly offers Fight for Sight fellowships and grants-in-aid. Closing date for receipt of completed applications for the 1962-1963 period is March 1, 1962. Information from Secretary of the NCCB, 41 West 57th St., New York 19, N. Y.

PERSONALS

Lt. Colonel V. Harry Adrounie, USAF, MSC,* formerly environmental medicine officer, Aerospace Medicine Division, Office of the Air Force Surgeon General, is now commander, Detachment 10, 1st Aeromedical Transportation Group, Mather Air Force Base, Calif.

* Fellow.

MORRIS BARRETT, M.P.H.,† formerly executive director, Westchester Chapter, Association for Help to Retarded Children, White Plains, N. Y., is now director of health education, Lankenau Hospital, Philadelphia, Pa.

LEROY E. BURNEY, M.D.,* received the Public Health Service Distinguished Service Medal in April in recognition of his outstanding service and achievement while on active duty in the Commissioned Corps of the Public Health Service. Dr. Burney is now vice-president for the health sciences, Temple University, Philadelphia, Pa.

ALLYN G. BRIDGE, M.D., M.P.H.,† formerly pediatric consultant, is now chief, Section of Maternal and Child Health, Minnesota Department of Health, Minneapolis.

ELIZABETH COOPER,† formerly public health nurse, Indian Hospital, Eagle Butte, S. D., is now public health nurse, Public Health Service Indian Center, Fort Washakie, Wyo.

WARREN P. DEARING, M.D.,* of Chevy Chase, Md., formerly director of health services, U. S. Office of Civil and Defense Mobilization, is now executive director, Group Health Association of America.

LT. COLONEL HENRY J. DONNELLY, MC, USA,* formerly preventive medicine officer, Hq., Military District of Washington, is now chief, Preventive Medicine Research Branch, Army Medical Service Research and Development Command, Office of the Army Surgeon General, Washington, D. C.

MAC ROY GASQUE, M.D., with Olin Mathieson Chemical Corporation (New York City) since 1949, is now medical director for the corporation, a new position.

LEON I. GINTZIG, Ph.D.,† formerly director of hospital administration research and development, Veterans Administration, is now associate professor of hospital administration, George Washington University College of Government, Business and International Affairs, Washington, D. C.

LOUISA E. HAAS, M.P.H.,* formerly chief, Health Education Branch, Division of Indian Health, Public Health Service, is now public health program adviser, Office of Program Planning, District of Columbia Department of Public Health, Washington, D. C.

JOHN C. HUME, M.D., M.P.H.,* formerly chief of the Health Division, U. S. Technical Cooperation Mission to India, is now professor of public health administration, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md.

JACK KASTEN, M.P.H.,* formerly assistant director, Jewish Memorial Hospital, Boston, is now research associate in medical and hospital administration, Graduate School of Public Health, University of Pittsburgh, Pa.

J. PHILIP KEEVE, M.D., M.P.H.,† formerly assistant professor of preventive medicine, University of Vermont, School of Medicine, is now health coordinator, City of Newburgh (N. Y.) School District.

RICHARD W. KENNETT is health educator, Division of Health Education, Kansas State Board of Health, Topeka.

G. FRED LEE, Ph.D.,† formerly professor of sanitary chemistry, University of Pittsburgh Graduate School of Public Health, is now assistant professor of water chemistry, Hydraulic and Sanitary Laboratory, University of Wisconsin, Madison.

AUBREY MALLACH,† formerly Forum director and administrator, Health Careers Program, National Health Council, is now special assistant to the director, Westchester County Community Mental Health Board, White Plains, N. Y.

RICHARD P. MASON, M.D. (Col., USA, MC, Ret.),* formerly director, Walter Reed Army Institute of Research, is now vice-president for research, American Cancer Society, New York City.

JOHN R. PAUL, M.D.,* professor of epidemiology and preventive medicine, Yale School of Medicine, has retired after 30 years' service on the faculty. He will continue work at Yale heading the World Health Organization Reference Serum Bank there.

WILLIAM PFISCHNER, M.D., M.P.H.,† formerly medical officer, U. S. Navy, is now director, Health District Three, Philadelphia Department of Public Health, succeeding ORLANDO CARROZZINO, M.D., M.P.H.,† now director, Health District Eight.

IRWIN M. ROSENSTOCK, Ph.D.,* formerly assistant chief, Research and Development Branch and director, Intramural Studies in Public Health Practices, Public Health Service, is now associate professor of public health administration, University of Michigan School of Public Health, Ann Arbor.

DIGHTON F. ROWAN, Ph.D.,† formerly principal virologist, Division of Laboratories, New Jersey State Department of Health, is now virologist, Montana State Board of Health, Helena.

PATRICK M. SCANLAND is health information writer, Division of Health Education, Kansas State Board of Health, Topeka.

ROBERT L. SMITH, M.D., M.P.H.,* formerly deputy director, Division of Health Mobilization, Public Health Service, is now gen-

* Fellow.
† Member.

eral medical consultant, Regional Office IX, Public Health Service, San Francisco, Calif.

ADDIE G. THOMAS,† formerly chief medical social consultant, The National Foundation, is now chief, Department of Social Work, The Johns Hopkins Hospital, Baltimore, Md.

JAMES WATT, M.D., Dr.P.H.,* formerly director, National Heart Institute, is now director, Division of International Health, Public Health Service, RALPH KNUTTI, M.D., formerly associate director, National Institute of Arthritis and Metabolic Diseases, succeeds Dr. Watt at NHI.

DEATHS

ULTAN B. BYRNE, M.B., D.P.H.,* of New Westminster, B. C., Canada, on July 10, 1959 (Mental Health Section).

MARY L. FRISZ,† educational director, Nursing Service, Memphis and Shelby County Health Department, Memphis, Tenn., on June 7, 1961 (Public Health Nursing Section).

RALPH HORTON, M.D.,† director, Homer Folks Tuberculosis Hospital, Oneonta, N. Y. (Medical Care Section).

MARY C. JARRETT, recognized as the "mother of psychiatric social work" and a pioneer in the study of chronic illness, on August 4, at the age of 85.

THAD PATRICK, M.P.H.,* sanitary engineer, Department of Health, Education, and Welfare, Communicable Disease Center, Atlanta, Ga., in August (Engineering and Sanitation Section).

ALMA L. WURDEMANN, M.D.,† general practitioner of Shinnston, W. Va., on August 21 (Mental Health Section).

CONFERENCES AND DATES

American Public Health Association. Ninetieth Annual Meeting, Miami Beach, Fla. October 15-19, 1962.

State and Regional Public Health Meetings—November, December, 1961, and January, 1962:

California, Southern, Public Health Association. Lafayette Hotel, Long Beach. December 8.

Connecticut Public Health Association. Les Shaw Restaurant, New Haven. November 30.

Mississippi Public Health Association. King Edward Hotel, Jackson. December 6-8.

Meetings of Other Organizations:

American Diabetes Association. Detroit, Mich. January 17-21, 1962.

American Hearing Society. Chicago, Ill. November 2-4.

American Medical Association (Clinical Meeting). Denver, Colo. November 27-30.

American Occupational Therapy Association. Sheraton-Cadillac Hotel, Detroit, Mich. November 5-11.

American Osteopathic Association. Las Vegas, Nev. January 15-18, 1962.

American Public Welfare Association. Biennial Round Table Conference. Chicago, Ill. November 29-December 2.

Association of American Medical Colleges. Queen Elizabeth Hotel, Montreal, Canada. November 8-16.

Association of State and Territorial Health Officers. Washington, D. C. November 8-10.

Council on Social Work Education. St. Louis, Mo. January 17-20, 1962.

Family Service Association of America. Biennial Meeting. New York, N. Y. November 12-15.

Inter-American Conference on Congenital Defects, First. Statler Hotel, Los Angeles, Calif. January 22-24, 1962.

National Association for Mental Health. Miami, Fla. November 15-18.

National Social Welfare Assembly. New York, N. Y. December 12-13.

National Society for Crippled Children and Adults. Statler-Hilton Hotel, Denver, Colo. November 17-21.

North American Association of Alcoholism Programs. Sheraton-Charles Hotel, New Orleans, La. November 5-9.

Pan American Association of Ophthalmology. Interim Congress. Lima, Peru. January 28-February 3, 1962.

Planned Parenthood Federation of America. Roosevelt Hotel, New York, N. Y. November 6-9.

Society of Public Health Educators. Detroit, Mich. November 11-12.

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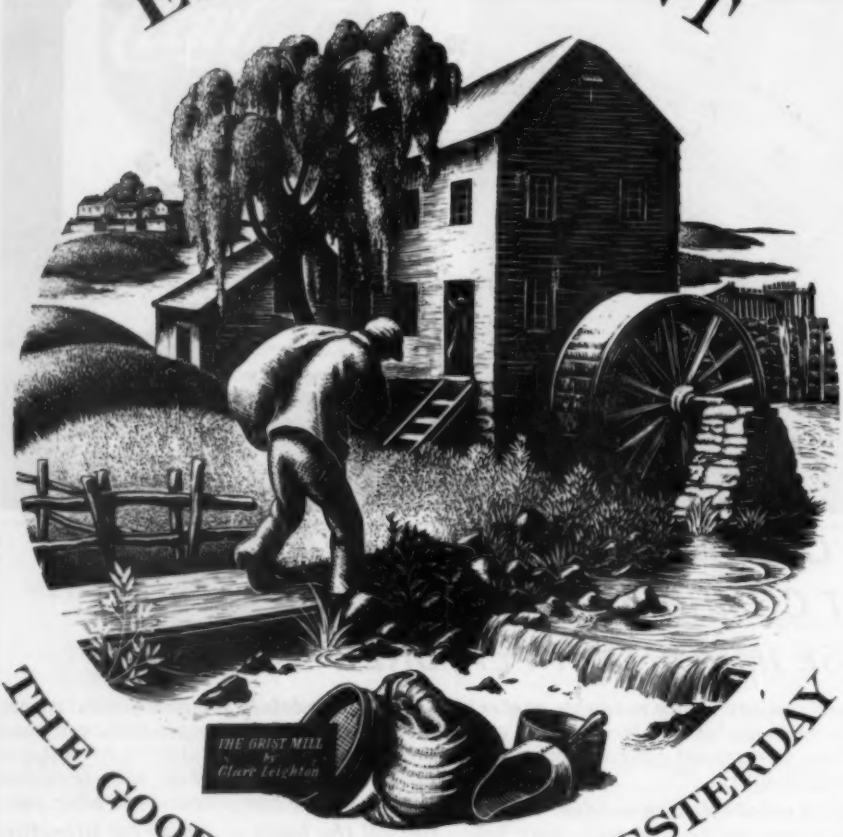

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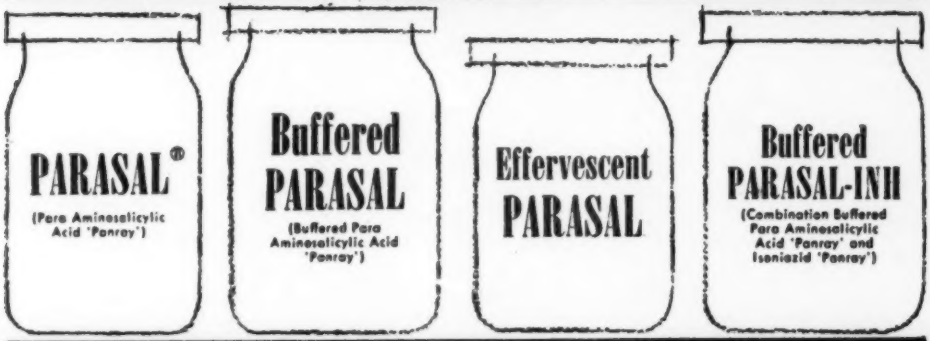

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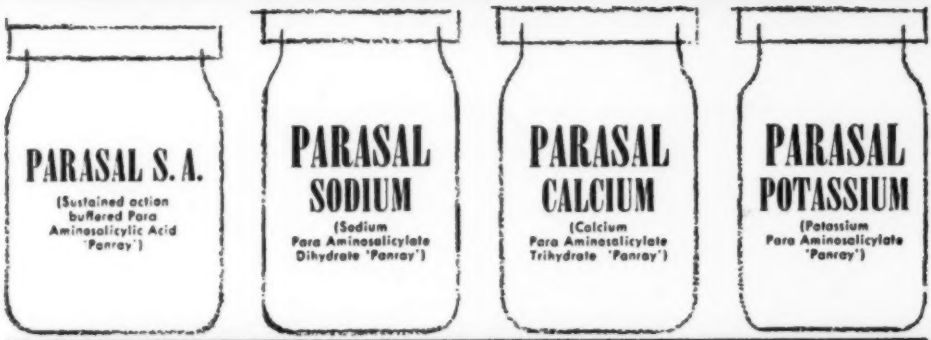

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